

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. 68: No. 20. New York, Thursday, November 14, 1901.

\$5.00 a Year, including Postage.
Single Copies, Ten Cents.

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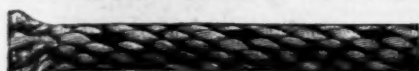


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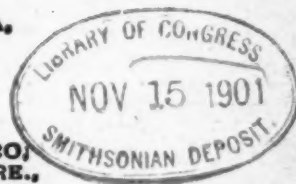
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CAHALL BOILERS See Page 106.

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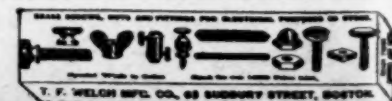
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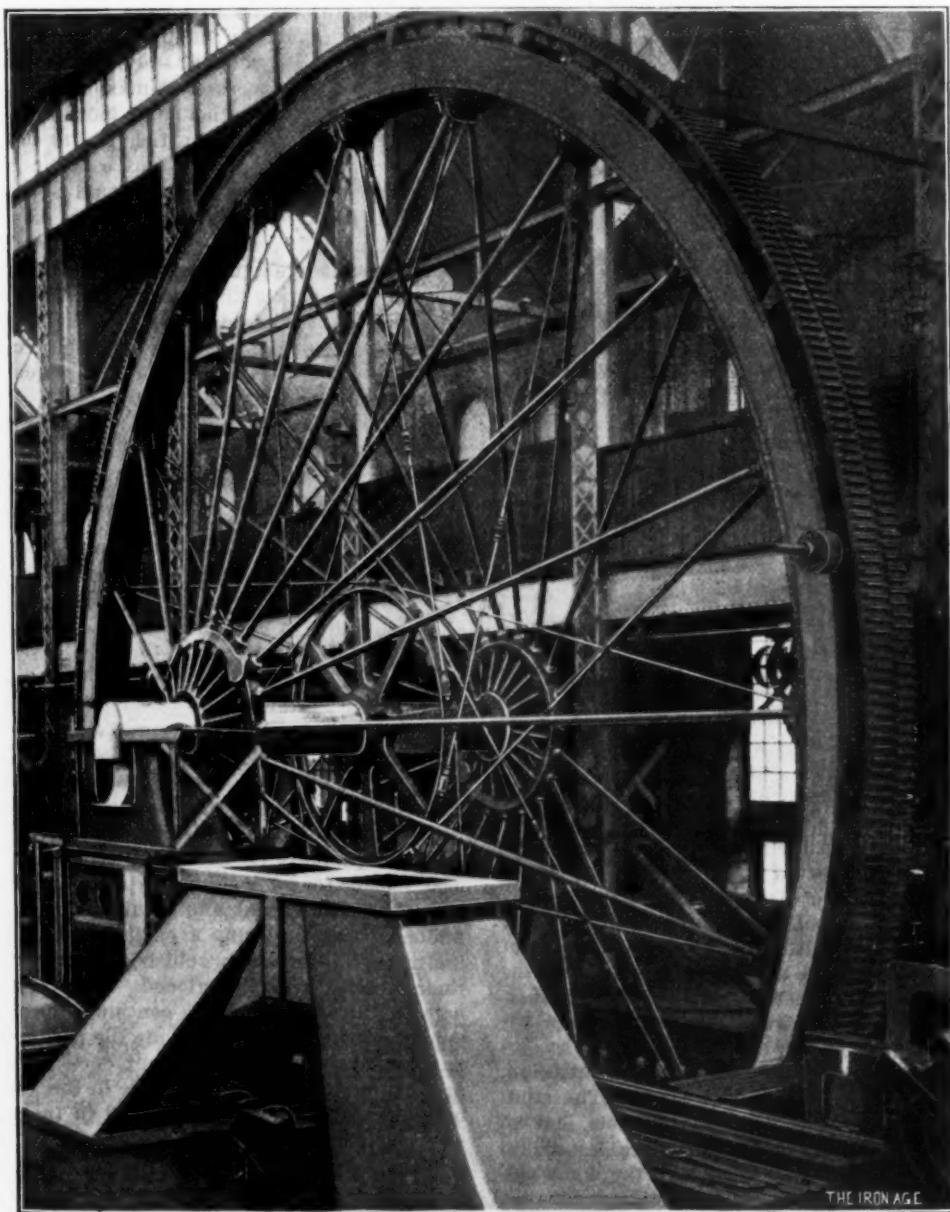
THE IRON AGE

THURSDAY, NOVEMBER 14, 1901.

Sand Wheel for the Calumet & Hecla Mining Company.

The Robert Poole & Son Company, Baltimore, Md., are finishing one of the largest wheels of its kind in the world. The wheel is known as a sand wheel, and was ordered by the Calumet & Hecla Mining Company for

either end of the shaft, each weighing 20,000 pounds, and from these hubs radiate 40 4-inch steel spokes, which support the rim sections on the same principle as a bicycle wheel, each spoke being arranged with special nuts and threads for fine adjustment when erected in place. The rim is built up in 20 segments. It consists of two concentric rings, one on the inside, for strengthening the entire structure, attached to the radial spokes,



SAND WHEEL FOR THE CALUMET & HECLA MINING COMPANY.

one of their copper mines at Lake Linden, Northern Michigan, near Lake Superior. It is being built from the plans of the company's engineer, E. D. Leavitt, of Cambridgeport, Mass., and is 65 feet in diameter, weighing with its base plates and supporting columns over 1,000,000 pounds. The axle is made of Krupp's crucible cast steel, is 32 inches in diameter and 27 feet long, with a 16-inch hole bored through the center, and weighs 42,000 pounds. The journals are 25 inches in diameter and 42 inches long. Two gun iron hubs are fitted to

and another on the outside consisting of a toothed gear rim fastened to the inside rim with bolts and keys. On the periphery of the outside rim are cast staggered or stepped gear teeth, and these teeth are milled with special tools to an accuracy of 1-1000 inch variation. The pitch of the teeth is 4.7 inches. Each row of teeth is 12 inches wide, making an effective working face of 24 inches. There are 26 teeth in each segment, or a total of 520 in the entire wheel.

To each side of the sectional rim is riveted a rec-

tangular plate iron box, carrying on its inner side 275 buckets, 550 in all, each bucket measuring 4 feet 3½ inches by 3 feet by 4 inches. The buckets are set at an angle, which, together with the peripheral velocity, prevents discharge until a horizontal position is reached near the top of the wheel. The distance across the face of the wheel when the buckets are fitted is about 12 feet. The lower part of the wheel dips in a shallow pit, into which the refuse from the stamp mills flows, and as it turns each bucket is filled with water, gravel or sand and carried up to be discharged at an elevation of about 50 feet into a trough, where it is carried away by the water in sluiceways, the discharge being close to 75,000,000 gallons in 24 hours. The pinion, or small wheel by which motion is given to the large wheel, has 23 teeth in each row, and is 37 inches in diameter, accurately milled to match the large wheel, and is fitted to a shaft carrying on its outer end a mortise, or wood tooth wheel, engaging with an iron pinion fitted on the motor shaft.

The electric motor for driving the wheel is of 750 horse-power and has a speed of 150 revolutions per minute. The large wheel makes about four revolutions per minute, and the peripheral speed at the inner edge of the buckets will be about 12 feet per second.

It is expected that the wheel will be ready for delivery in about four months, when 30 or 40 gondola cars will be required for its transportation.

A French-American School.

At Paris, on the 7th inst., M. Bouquet, Director in Chief of the Department of Technical Instruction of the Ministry of Commerce, confirmed the statement that the Minister of Commerce, M. Millerand, proposes to appoint a committee to elaborate a plan for the establishment of a French school in the United States devoted to the study of American industrial methods. M. Bouquet said:

M. Millerand is himself the initiator of the scheme. We realize that America now leads the van in industrial progress. She is far ahead of England, Germany and ourselves in organization and methods of work. Hitherto we have been sending numbers of engineering students to Germany, England and Belgium, but the Minister has come to the conclusion that the field which offers the greatest profit for their study is the United States. He has therefore resolved to concentrate his efforts there. A few students will still be sent to European countries to study special industries, but for general technical education they will go to the United States, where they will be able to study, under competent guidance, that audacity, inventive genius and marvelous organization which have lifted the industrial world of America above those of her European rivals.

A central bureau or college will be established in Philadelphia or Chicago, with a director and a couple of sub-directors, who will be fully acquainted with the working of the various industries under their guidance. The students will examine works specially chosen for superior methods and the newest plants.

The step we are taking ought not to excite suspicion, as it is really homage to the United States. The students will not go to discover industrial secrets, but to finish their education, and before the scheme is put into execution we shall ask the co-operation of the American Government and leading American industrial concerns.

The expense will be met partly by a Parliamentary grant and partly by subscriptions raised among the Chambers of Commerce, the industrial associations and the big industrial concerns of this country. Many encouraging promises have already been received. We hope the scheme may be carried out early next year.

Official Map of Nebraska.—We have received from C. E. Watson, State Deputy Commissioner of Labor, Lincoln, Neb., a map of the State, giving in addition to the map itself a variety of tables containing much interesting information. These tables cover population, area, organization, &c., of counties, irrigation grants in Nebraska, vacant Government lands, statistics relating to

grain, live stock, &c., marketed in 1900; a list of well-known artesian wells in Nebraska, the Omaha stock market report for 1900, selling prices of farm lands per acre and farm help and wages, Nebraska public school statistics, &c. In addition views are given of a number of the important buildings throughout the State.

Increased Use of Terne Plate Roofing.

A careful inquiry into the state of the roofing plate trade, says *Tin and Terne*, develops the interesting fact that the production has increased to a very marked degree of late. As a result of careful investigation it may be stated that the production of all grades of terne plate in the first six months of this year exceeded the production in the same period last year by fully 96 per cent., so that in the space of one year the production has very nearly doubled.

The indiscriminate use of any kind of terne plate for roofing a few years ago gave this form of roofing a rather bad reputation in some quarters. A good many of the producers were possibly not very well informed as to the proper processes to make a roofing plate which would stand the weather, and those makers who have steadily produced a good article had to suffer along with the whole trade. Added to this was the general lack of information as to how a roof should be taken care of in order to get the best results. There has of late been more thought given to the subject of paint, and there is no question that makers of terne plates are putting up a better article than formerly. The public also is learning to discriminate and not use the cheapest grade obtainable, but is rather buying a better grade, which naturally gives better results and leads to increased consumption.

The evidence that the tendency is toward the better grade of roofing, as against lightly coated plates which should be used for temporary structures only, lies in the fact that while last year the quantity of terne plate produced which carried a coating heavier than, say, 18 pounds per double box was about one-fourth the total terne plate production, the proportion in the first half of this year is found to be close to one-third, the increase in the production of common ternes being probably a little under 85 per cent., while the increase in the production of the heavily coated plates was close to 130 per cent.

There is no question in the minds of those who have made a careful study of the subject that terne plate is the best form of roofing, all things considered, provided the plate is of good quality and the roof is properly taken care of. The trouble has been to make sure that good plates were being used on the building and that the roof was properly taken care of afterward. It is not an easy matter for an architect to persuade a builder to employ the best material, and architects have frequently refrained from specifying a particular brand, which they had reason to believe would be satisfactory, for fear of their motives being questioned. It is very gratifying to note that all signs point to a continued increase in the consumption of terne plate. While the production now does not constitute more than about one-eighth of the total production of tin and terne plate in the United States, a continuance of the increase noted in the past year will soon put this branch of tin plate industry in a more important place than it formerly held.

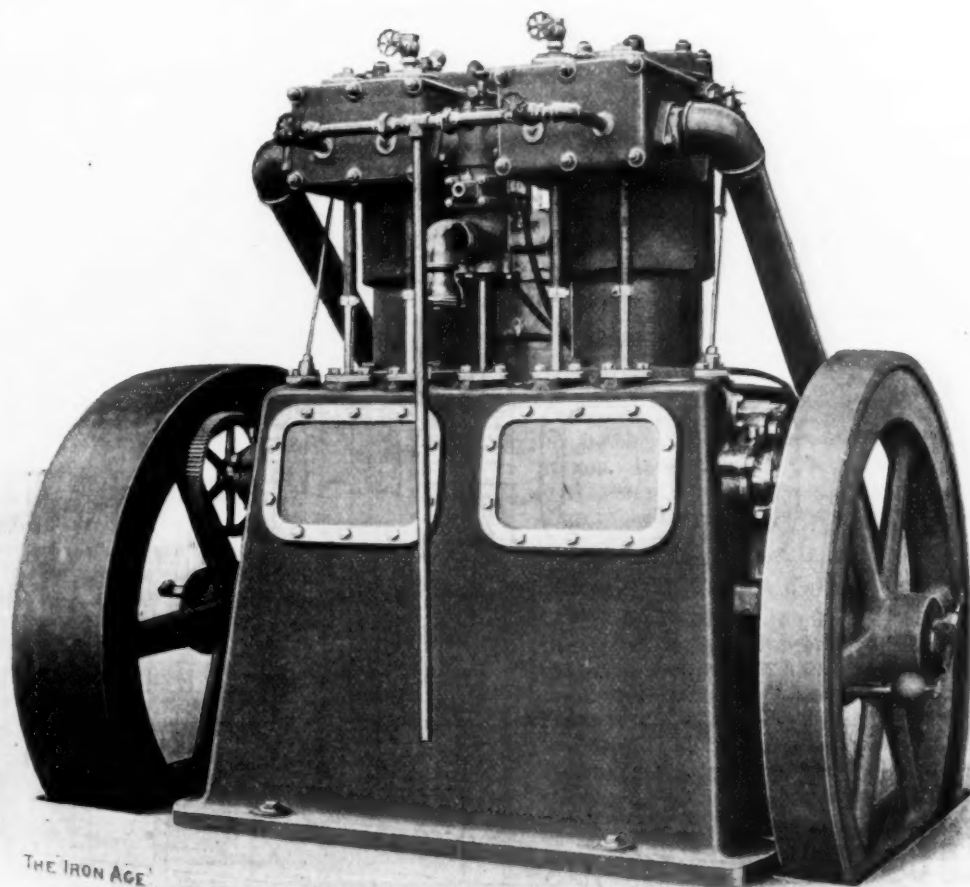
Record Rail Shipment of Ore.—Under the supervision of high officials of the Lake Shore Railroad system and the officials of the Jamestown and Franklin Branch, the marvelous record of sending south from Ashtabula to the Pittsburgh furnaces in one day 39,200 tons of iron ore in addition to hundreds of tons of other freight was accomplished Sunday. Fifty-five trains were handled in 24 hours. Sixty-five locomotives in all were used. Thirty-five locomotives and 15 crews were borrowed from the main line for the occasion. Several trains were also sent East during this time. The day's record established is believed to be the best ever made over a railroad between an iron ore receiving harbor and the furnace districts.

The Maywood Gas and Gasoline Engine.

The gas and gasoline engine built by the Maywood Foundry & Machine Company, of Maywood, Ill., is of the vertical multiple cylinder type, with the crank shaft, cam shaft, rocker shaft, connecting rods and all main bearings and working parts inclosed in an oil tight base and running in an oil bath which furnishes perfect lubrication to all parts, including cylinders and pistons. These important parts being thus oiled as long as a supply of oil is kept in the crank case, there is no danger of hot bearings from the carelessness of attendants. Being inclosed, these parts are free from all dust and dirt, are out of the way and require no attention except

are of platinum-iridium and are very durable. The igniters can be removed for repair in a few minutes in case of accident. Current for ignition is obtained from an Edison-Lalande battery and spark coll, or direct from dynamo. It is preferred to connect them up with both battery and dynamo by means of a double throw switch, using the battery to start with and then switching to the dynamo as soon as the engine is in operation. This saves the battery and furnishes a ready means of knowing whether the igniters are working properly by the breaking of the circuit on the three or four incandescent lamps through which the current passes. The fly wheels are turned at the rims and hubs, making them run very smoothly and truly.

The gears which transmit power from the crank shaft to the main shaft are very heavy, are made of



THE MAYWOOD GAS AND GASOLINE ENGINE.

to see that all parts are tight and the occasional addition of oil to the crank base. The cams, cam and rocker shafts, igniter cams and rods are all easily accessible by removing the two front doors on the engine. The two rear doors give easy access to the main bearings and connecting rods.

The connecting rods and crank shaft are made of forgings, and are very heavy. The main crank bearings are of babbitt. The crank and wrist pin bearings are of phosphor bronze. The pistons have five spring rings. The tops of the pistons are removable for adjustment of the wrist pin bearings without the necessity of taking them out. The cylinders are very heavy and are made of close grained iron, with water jackets of ample size to secure proper circulation to keep them cool. The valve chests are securely bolted on the front of the cylinders and are so made that when the valve seats are worn they can be bored out and bushed. They are thoroughly water jacketed. The valves are of the direct acting poppet type. The igniters are operated by hardened steel cams on the cam shaft. They are thoroughly insulated and the points

steel castings and are cut from the solid. A neat cover is placed over them to protect them from dust and dirt, and the possibility of anything falling into them.

Governor.

The Maywood, being a multiple cylinder engine and operated with a throttling governor, takes a charge every revolution on the double cylinder, and a charge every two-thirds of a revolution on the three cylinder engine. The amount of fuel admitted to the cylinders and the force of the impulse are exactly proportioned to the requirements of the load. The governor is of the fly-ball type and acts directly by means of a lever and rod on the mixing chamber valve, through which both the air and gas are admitted in definite and proper proportions to form a perfect explosive mixture. The motion of the lever and rod opens or closes this mixing valve as the load may require, and thus the exact amount of explosive mixture necessary to carry the load is at all times admitted to the cylinders, and so sensitive is this mechanism that it instantly responds to the widest fluctuations of load. Not only is great steadiness

secured in this way, but the impulses being regularly given with every revolution and of much less intensity than in the "hit and miss" engine, there is avoided the severe shock and strain incident to the slowing down and sudden raising of speed. This prolongs the life of the engine and minimizes repairs. The proportion of gas or gasoline to air is regulated by a valve on the outside of the mixing valve and may be instantly changed and set anywhere so as to give from one portion of gas to eight of air to one portion of gas to 20 of air, as the quality of the gas being used may require. A dial over which a pointer attached to the lever oper-

from one to the other while the engine is running; the only thing necessary to do being to shut off one valve and open the other. This feature is useful where the engine is being operated with gasoline in case anything goes wrong with the supply pipes or gasoline is unexpectedly exhausted.

Central Pennsylvania News.

HARRISBURG, PA., November 12, 1901.

The most important event of the early days of the month was the visit paid to the works of the Pennsyl-

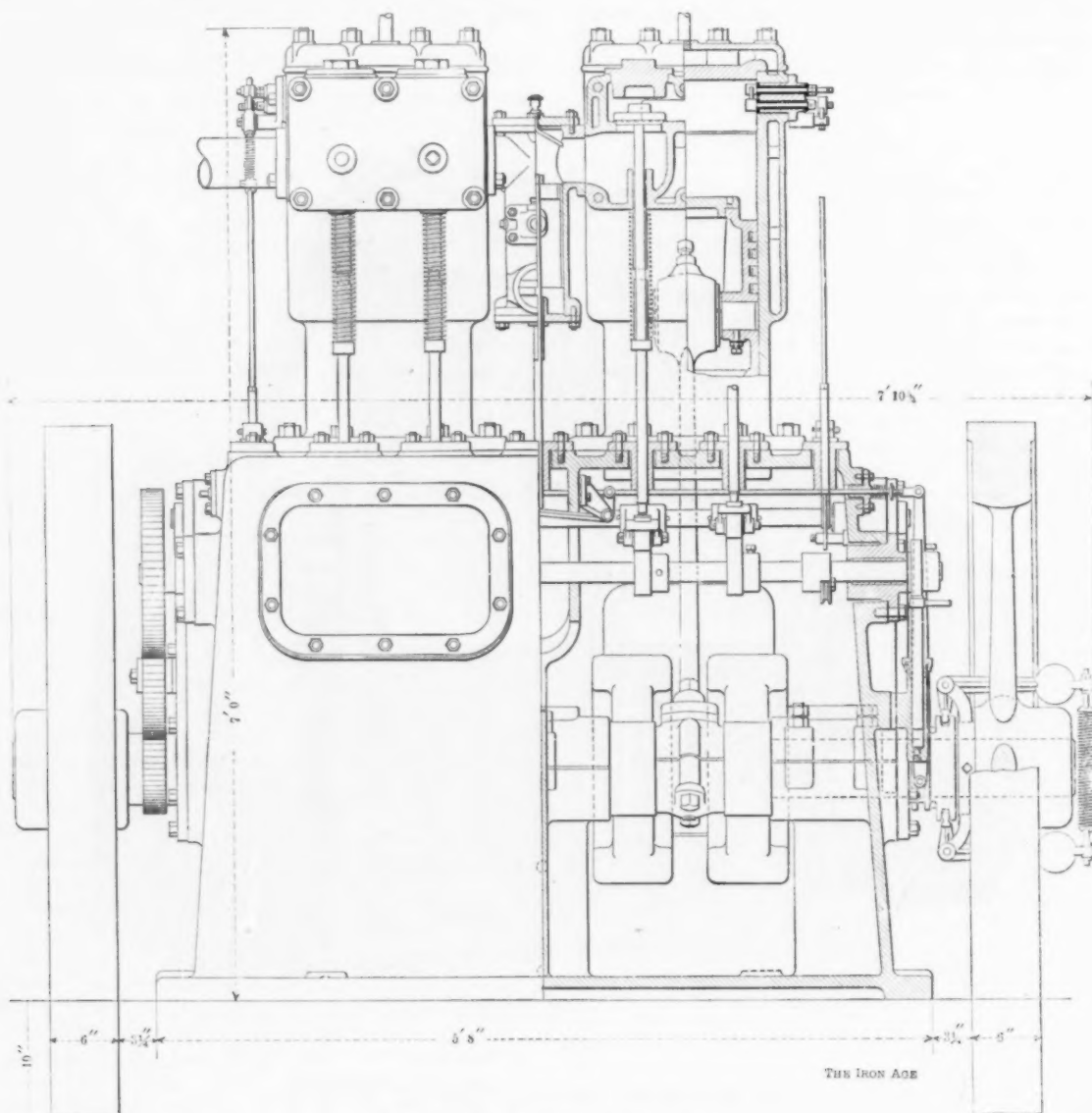


Fig. 2.—Sectional Front Elevation.

THE MAYWOOD GAS AND GASOLINE ENGINE.

ating the gas valve moves, indicates the exact proportion.

Another important feature in the governing of the engine is the ability to regulate the speed while running. This is done by turning a little thumb screw on the governor rod, which increases or decreases the tension on the governor spring, and causes the governor to open a greater or less distance as desired. By this means the speed may be varied as much as 50 revolutions per minute without affecting the steadiness of the power. This, in case of a temporary overload, becomes very valuable, as the power of the engine is considerably increased by speeding it up. This should be done only in case of necessity, as the higher speed increases the wear on the engine.

These engines are so built that either gas or gasoline may be used, and if desired are furnished with both gas and gasoline inlet, so that a change can be made

from one to the other while the engine is running; the only thing necessary to do being to shut off one valve and open the other. This feature is useful where the engine is being operated with gasoline in case anything goes wrong with the supply pipes or gasoline is unexpectedly exhausted.

vania Steel Company by the Board of Directors of the company. They inspected all departments, including the additional buildings which are in course of erection at the eastern end of the works and which will cost approximately \$3,000,000. It is not improbable that still greater improvements will be made to the works, especially along the lines of the bridge and construction and frog and switch departments. Most significant was the party of inspection, for it represented the interests which now control the company, as follows: T. N. Ely, superintendent of motive power, and George Wood, director of the Pennsylvania Railroad; George F. Baer, president of the Philadelphia & Reading; Major L. S. Bent, for many years the head of the steel company; Arthur Brock and G. Dawson Coleman, whose Lebanon furnaces and ore properties were acquired by the steel company this year; Evans Dick, the Philadelphia banker, and others. After the inspection at Steelton the party

left for Lebanon to inspect the furnaces and ore mines at Cornwall.

The Lalance & Grosjean Company will shortly put into operation the foundry, 50 x 90 feet, which has been in course of erection at the company's tin plate works here. There will be two cupolas.

The directors of the Susquehanna Iron & Steel Company have decided to build a \$100,000 pipe mill at Columbia, and plans are now being drawn.

The Harrisburg rolling mill is preparing to start four additional puddling furnaces which have been built this year. Eight were started last month.

years prospecting has been carried on, but recently a deposit, which it is thought will prove valuable, has been discovered, and a company have been formed with \$10,000 capital to mine the ore. The ore is a magnetite and rich in iron.

The Marshall Furnace at Newport, Perry County, has been put into blast.

The Pennsylvania Steel Company are reaping the fruits of the closer relations of the Pennsylvania Railroad with the Norfolk & Western and Baltimore & Ohio railroads. Orders for several thousands of tons of rails have been given to the company by those roads.

The Central Iron & Steel Company, who received an order for steel plates for the Navy Department, have shipped over 4000 plates to the various yards about the country. They are being used in repairs to war ships.

It is said that changes and improvements are to be made to several of the furnaces in the Lebanon County district. The Lackawanna Iron & Steel Company's coke plant is about completed and other improvements are projected for the land recently bought at West Lebanon. The Colebrook works of the company are to be made important producers of iron for the company's enlarged system of plants.

The Pennsylvania Steel Company made a great record in relining and starting their No. 1 furnace at Steelton. The stack was blown out on October 14 and was put into blast on November 7, having been relined and overhauled in that time. The work was done under direction of Assistant Superintendent Dougherty, and the stack's lighting was cheered by the workmen. The last campaign of the furnace was about three years.

The Wrightsville hardware works are to be enlarged.

The Cambria Steel Company have started on an order for 2500 steel cars for the Pennsylvania Railroad.

Reports from the Bethlehem Steel Company's works for October indicate a record breaking output in every branch. It is said that the product of the furnaces was increased at least 6 per cent., and that other departments were rushed to points never before attained by the company.

S.

Sault Canals Traffic.

The traffic of the canals at the Sault Ste. Marie, at the outlet of Lake Superior, for the month of October showed a total of 4,174,545 tons, making it one of the large months in the history of the great lakes. The traffic in the leading commodities for the month and for the year to date, compared with the entire season of 1900 and 1899, in those same commodities, is as follows:

Article.	Year to October.	Season October 31.	Season 1900.	Season 1899.
Copper, net tons....	21,319	83,212	131,066	120,090
Grain, bushels.....	3,758,519	13,617,814	16,174,659	30,000,935
Flour, barrels.....	1,237,737	5,139,009	6,760,688	7,114,147
Iron ore, gross tons..	2,410,040	14,546,300	14,628,186	13,685,928
Lumber, M feet.....	160,408	931,985	909,651	1,038,057
Wheat, bushels.....	9,362,647	33,026,341	40,489,302	58,397,335
Coal, all varieties, tons	549,519	4,175,790	4,486,977	3,940,887
Manufactured iron, tons	34,440	147,490	135,585	214,585
All traffic, net tons..	4,174,545	24,543,610	25,643,073	25,255,810

There remains the month of November and a part of December in which to bring the tonnage of 1901 to that of the preceding year. There is little doubt that it will pass last year's record by considerable, and it may be that the gross traffic of the canals for the present year may be between 26,500,000 and 27,000,000 tons.

D. E. W.

Incidental to the recent automobile show at Madison Square Garden, New York, an attempt was made to form an organization of the builders and dealers of the horseless vehicles. The project was not successful. It was the intention to form an association or society whereby the dealers would co-operate in the business carried on with the manufacturers, the objects being to obtain uniform and advantageous arrangements regarding prices and terms. About 15 dealers and manufacturers were represented, including some of the most prominent in the trade. It was finally concluded that it would be impossible to form an organization of sufficient strength to influence the relations existing with manufacturers.

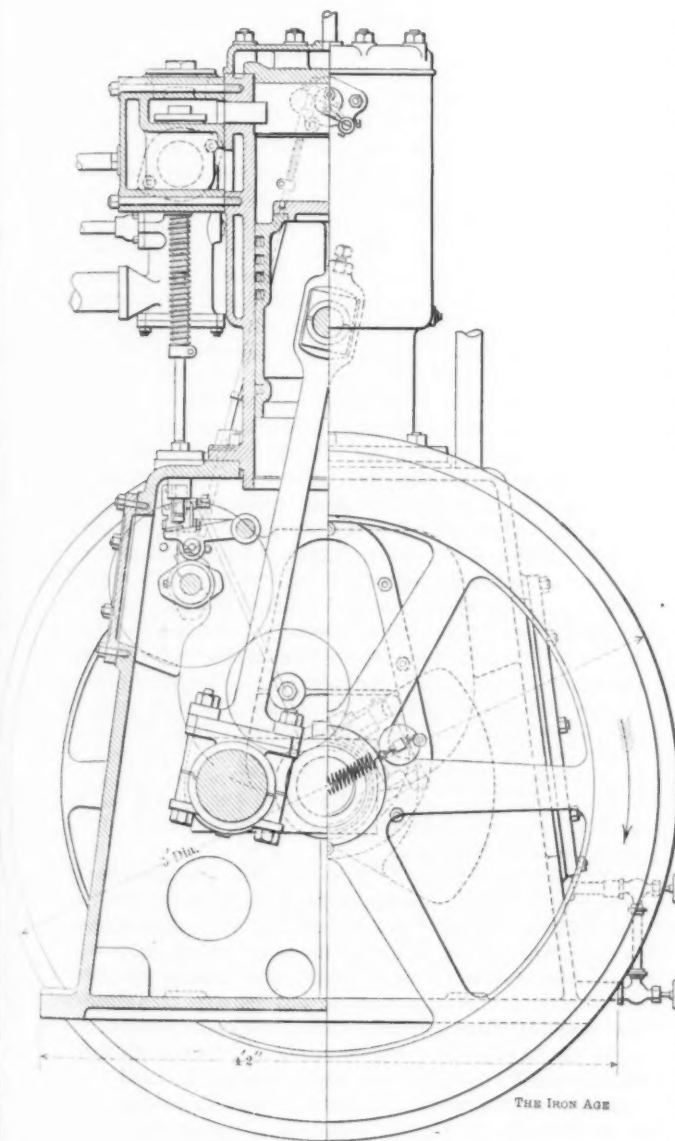


Fig. 3.—Sectional End Elevation.

THE MAYWOOD GAS AND GASOLINE ENGINE.

The Pennsylvania Steel Company's rail mill at Steelton has been running as high as 1400 tons per day in the last fortnight.

The works of the Harrisburg Pipe & Pipe Bending Works are being run night and day this week. The pipe mill, which has been idle for a short time for repairs, has been started up and will be run to its capacity. The coil department is very busy.

The car famine has caused no end of trouble for the rolling mills in this part of the State. Every works has been compelled to draw heavily on stock or to run at a reduced rate because of inability to secure the steel needed. One works received only 61 tons, when over 800 should have been delivered. Shipments from the West have been generally held back.

Efforts are being made to develop iron ore deposits in the vicinity of Halifax, in Dauphin County. For several

Canadian News.

Canadian Manufacturers' Association.

TORONTO, November 9, 1901.—The thirtieth annual meeting of the Canadian Manufacturers' Association was held in Montreal on the 5th and 6th inst. Upward of 100 members were present. After the civic welcome extended by the Mayor and certain hospitalities by the Civic Reception Committee the association proceeded to business.

The report of the Tariff Committee, which was first received, pointed out that a resolution from the Executive Committee asking that the drawback of duty paid on articles entering into goods for export should be allowed when these goods are manufactured in Canada, was acceded to. The committee had also asked increased protection for woolen manufactures, but this was not granted. The matter was referred to the consideration of the association. It had also been recommended that iron tubing and angle iron for spring beds should be admitted free, and it is hoped that the Government will do this. The committee further also called for a duty on lumber. It was reported to be inadvisable for the association to protest against the action of the Government in placing beet root sugar manufacturing machinery on the free list, seeing that the change was for only one year.

By the Parliamentary Committee a report was presented in which the Alien Labor act was adverted to. Amendments had been recommended to prevent hardships to manufacturers. The result of this activity on the part of the committee was that there was secured the insertion in the bill of a clause providing that the act should not apply in the case of skilled labor not obtainable in Canada, and required for the development of any Canadian manufacturing industries. The committee was also successful in its opposition to a bill introduced to amend the Trade Mark and Design act by making the union label rank as a trade mark.

P. W. Ellis, the president, presented the annual report, and made an address in which he touched on several important points. He expressed the belief that thinking men of Canada breathe easier now that the tariff is out of politics. On this subject he said:

We have to-day what may, I think, be fairly called a moderate tariff, one to which no section of the community with the well being of the whole at heart can take exception, for all must admit that in a new country capital will not invest itself in manufacturing unless it has some assurance that it will not be swamped by the manufactured goods of older countries who produce for a larger market.

Reciprocity with the United States.

On the question of reciprocity President Ellis had this to say:

I believe the feeling in Canada to-day to be that if we begin to talk reciprocity with the United States the United States will reciprocity us out of business. Why this feeling? It is because the people of Canada feel that any substantial advantage to them would be contested, while every effort would be directed toward securing a freer access to our market. The people of Canada are not ignorant; they read and study. They see that our imports last year from the United States were \$119,306,000, while the exports to them of our products, not including precious metals, were less than \$44,000,000. Is this satisfactory? No, and I am much mistaken if there is not in Canada to-day a strong feeling in favor of terminating this most unsatisfactory arrangement whereby their goods have an easy access to our market and ours are practically excluded from theirs. The manufacturers do not seek to foment trouble, but I am confident that before we can ever hope to gain from the United States any favorable access to their market we must first assume, not a defiant or hostile attitude, but a determined, manly, national spirit, and show to them that we propose to guard our own interests first, last and always. This makes me feel that before any reciprocal arrangement is possible we must adopt a scale of duties against their goods that will have the same effect as theirs has at present on ours, and by this means alone I think it possible to have the United States extend to us the reciprocal arrangement that will give us the benefit our people desire.

Preferential Trade.

On this subject Mr. Ellis said:

But I must turn now to a country with which our trade relations are more pleasant, Great Britain. The original preferential tariff, subsequently increased to 33 1-3 per cent., was a change in our fiscal policy which was much more likely to affect our manufacturers than any one class, and that they accepted

the same without any determined protest speaks volumes for their loyalty and attachment to the British Crown. They understood it as a move to improve the feeling of the British people toward Canada, a feeling which, it was hoped, would show itself in larger purchases of our great output of farm products. At the same time I am sure it is the opinion of Canadian manufacturers that the duty of the Government is to legislate, first for Canada, and for Great Britain afterward; in other words, that the preference should give the British manufacturer a substantial advantage over his foreign competitor, but not over the Canadian, and that when any Canadian industry has suffered attention should be given promptly and fairly.

In concluding this reference to tariff matters, it is well to refer to the strong feeling that I believe prevails among the manufacturers of Canada in favor of obtaining, if possible, some reciprocal trade arrangement between our country and the other sister colonies, as well as Great Britain herself. While we recognize the difficulty attending the bringing about of such an important matter, and the diplomatic rules that have to be observed, we would strongly urge our Government to keep this matter ever in mind, and to take every fair opportunity to press forward toward its accomplishment.

South African Market.

James Cumming, who was sent by the Government to investigate the possibilities of trade in South Africa, gave an interesting description of his five months' sojourn in that country. He said that the country would never amount to much from an agricultural point of view, and that any Canadian who went there to farm would lose money. But it was the greatest buying country in the world, and was likely to continue to be so for many years. While there he had noticed Canadian agricultural implements, carriages, wagons, boots and shoes, canned goods, bacon, cheese, furniture, all of Canadian make, but mostly from New York and London. These goods were not pushed by Canadians. The expense of sending travelers was too great for any one firm, but Canadian manufacturers, say, 10 or 12, should club together and send a man to South Africa to push their goods. He also thought that the Government should help manufacturers to get their goods there by spending a little money on a direct steamship line. In conclusion, Mr. Cummings unexpectedly interpolated a vigorous denunciation of reciprocity with the United States, which, he declared, would make us hewers of wood and drawers of water.

The Russian Market.

T. A. Russell, the secretary, read the report of William Whyte, assistant to the president of the C. P. R., upon trade with Russia.

Mr. Whyte's report, addressed to Sir Thomas Shaughnessy, after describing the railway itself, says that from Cheliabinsk east to Lake Baikal agriculture is pursued in a primitive way, though the Government is now introducing American and other implements. Eastward from Irkutsk the inhabitants are chiefly free natives and nomadic tribes, with a sprinkling of convicts. Nevertheless, American reapers and self binders are being introduced by local Government agents. Toward Vladivostock there is a fairly good agricultural country and a good deal of grain is exported. During his visit a tariff war was being waged between Russia and the United States, in consequence of which the trade done by the Americans in axes, electrical goods, &c., was being diverted to England and other countries. Implements are admitted free. When the tariff war is over there is sure to be a large increase in imports from the United States, chiefly of implements, portable engines, and the like. From Irkutsk merchants he learned what goods are in demand in Eastern Siberia. There is a good demand for pumps, binders, reapers, steam threshers, portable engines. Saddlery is chiefly obtained from Moscow, but a good business can be obtained in American goods. American axes weighing 4 and 5 pounds each are considerably used in the trans-Baikal. American saws and files are also extensively used there. Shingles are not known at all. Sheet iron is much used for roofing, and can be bought at 36 pounds for \$3, and there is a tremendous demand for it. American harvesting machinery is used to a large extent throughout the Orenburg, Irbalsk and Iomsk Governments, and eastward to Achinsk. Mr. Whyte further enumerates as in demand horse rakes, straw cutters, seed sowers, scythes, spades, harness, &c.

C. J. Alexander, vice-president of the South Scotland Chamber of Commerce, delivered a brief address upon Canadian manufacturing from a British standpoint.

Further Business.

On Wednesday a considerable amount of business was transacted. Resolutions favoring changes in the duties on certain articles were passed. The agricultural implement section asked the support of the general association for the petition in favor of higher duties on implements. The Iron and Steel Committee recommended that the association ask the Government to consider the necessity of granting an adequate degree of protection to such new lines of manufacture as should be undertaken by the Canadian producers of iron and steel goods. It was recommended that a consular service similar to that of the United States be instituted for the study and development of foreign markets. The Transportation Committee's report was adopted. It emphasized the following points: Opposition to the granting to competitive manufacturers situated in Great Britain and the Eastern States of better rates than given to Canadian manufacturers from important shipping points like Montreal and Toronto; the unjust operation of several local rates as compared with through charges; the injustice of charging higher rates to Western Ontario shippers to the seaboard than is charged to United States shippers from Detroit and Chicago when their freight passes over the same lines; finally the unsatisfactory manner of dealing with claims.

The Banquet Speeches.

At the banquet Wednesday evening four of the Ministers of the Crown were present, including Sir Wilfrid Laurier, the Premier, and Mr. Fielding, the Minister of Finance. Mr. Borden, the leader of the Opposition, was another guest. All made speeches. The most important points in the speeches of the Ministers were as to the necessarily adaptable nature of tariffs, and the attitude of the Government toward reciprocity. Sir Wilfrid said the tariff was not permanent, but must move with the times. Delegation after delegation had been sent, he said, to the United States to secure reciprocity, but he declared that his Government was not sending any more. He rather expected that it would not be long before delegations were coming from Washington to Ottawa to look for reciprocity.

C. A. C. J.

Pacific Coast News.

SAN FRANCISCO, CAL., November 7, 1901.—The strike still drags along tedious and interminable. It will come to an end some day, but no one seems to know when. It will end if only through a process of disintegration. Indeed that is going on slowly but surely. Those connected immediately with shipbuilding interests have stepped out of the ranks of the strikers and gone back to work. The Shipwrights' and Calkers' Union of this city have declared the strike off as far as they are concerned. Some 60 men have gone back to work at the yards of the Union and Risdon Iron Works on the old terms. Each man has lost upward of \$520 in wages during the period of the strike. As against this they may, of course, credit what strike benefits they have received—an unknown quantity, but as it all comes out of them eventually, their real loss is in the neighborhood of the figure above named. The strike came to an end after a consultation between the representatives of the men and the managers of the Union and Risdon Iron Works. The schedule of wages is the old one, \$3.75 a day for new work and \$4.40 a day for old. Should the machinists win the nine-hour day the shipwrights and calkers will have it, too. There were about 20 men who could not find work, but the labor of all, and more, will soon be required.

The men had begun to desert the union and to go back. The return of the shipjoiners, fitters, riveters and boiler makers is soon looked for. Nevertheless there is no sign of this happening as far as the public are aware, hence the feeling to which I have given expression above. The machinists proper—that is, the organization—seem to be especially obdurate, and various predictions as to their return have proved to have had lit-

tle foundation in reality. It is now claimed by some that the strike will come to an end after the municipal election, November 5. There is a labor ticket in the field, but it is not generally approved even by the strikers. The defeat of the ticket, which is morally certain, would no doubt weaken the strike, more particularly as the majority of the strikers would go back at once if the more aggressive would allow them. The lessening of the number to receive strike benefits may, however, have a tendency to prolong the struggle, as there will be more money to go round.

It is said that the Standard Oil Company is about to have a pipe line from the oil fields of Kern County to some point on the Bay of San Francisco, and the Oil Association, a new organization of producers, another. There will be here several millions spent on pipes, &c., so that good times are in store for this department of the iron trade and for iron manufacturers in general. It is also whispered that the United States Steel Corporation are about to develop the iron resources of the State. In the lower part of the San Joaquin Valley exist immense deposits of iron ore known from the form of the hills where they are found as the Minarets, and it is alleged that the giant corporation have had a railroad line surveyed to them, and that they have made large purchases of oil lands with the purpose of using the fuel in the reduction of the ore. It has been generally contended that no means could be found of utilizing the oil in this way, so that here there is some room for doubt, but it is certain that lands containing great beds of iron ore in Shasta and elsewhere have changed hands during the past couple of years. It is said that the object of the corporation is to make the Pacific Coast and California particularly the seat of the great establishments that will in future supply the trade of the Orient and of the Pacific at large. Should this prove to be the case our industrial awakening will have begun. We have iron and oil to no end, enough to supply the whole world with iron and steel let alone the Orient. With such an enterprise our "Iron Age" would have at last begun. In a couple of weeks I may be able to announce this enterprise as an undoubted reality.

We have had some heavy rains during the past three or four days, and the outlook for everything in the agricultural line is good. The rain did some damage, but its benefits far outweigh this. And our clearing house exchanges are growing—of late being the record, and in some instances being 25 per cent. ahead of those of last year. Our export trade is growing at a great rate, and taking in shipments to the Hawaiian Islands last week's figures were close on \$2,000,000.

J. O. L.

A Beam of Unusual Section.—The American Universal Mill Company, 76 William street, New York, have just received from Luxemburg a piece of steel beam of rather unusual section, turned out by a Gray universal rolling mill recently completed at Differdange. This beam is 127-16 inches in height and the breadth of the flange is 11¼ inches. The section thus represents the letter H, the extreme measurements approximating a square. The thickness of the web has not been greatly increased, as might have been expected, to accomplish this feat of rolling, but is the same as that of the flanges. The original beam from which the piece was cut was 55 feet in length. The mill at Differdange was built by the Société Anonyme des Hautsfourneaux de Differdange, under the Gray patents, owned by the American Universal Mill Company. It will be remembered that the Gray process of rolling beams was first successfully demonstrated at the plant of the Ironton Structural Steel Company, Duluth, Minn. The American Universal Mill Company will be pleased to have engineers, architects and others interested visit their office to see this beam.

A new technical journal is to be started at Tokyo, Japan, entitled *The Kogyo-Sowa*, which means "poly-technic chat." The publisher and proprietor of the new journal is Y. Isawa, and his address is No. 1, Tsunohazu, Yodobashi-chio, Tokyo, Japan.

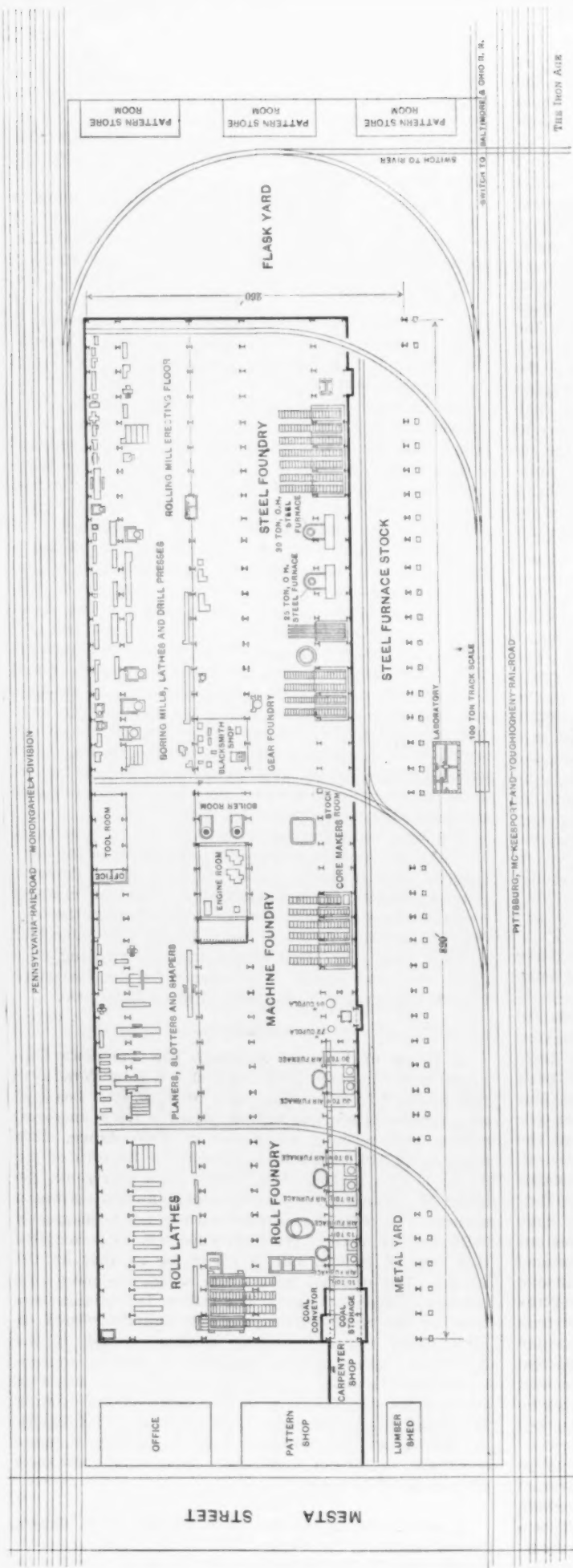


Fig. 1.—Ground Plan.

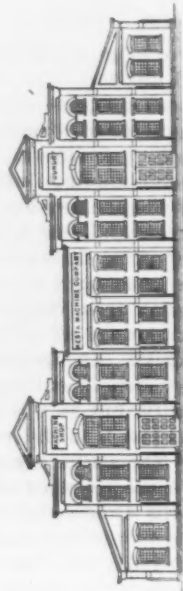


Fig. 2.—Front Elevation.

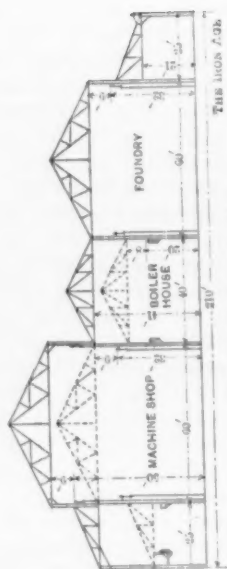


Fig. 3.—Cross Section.

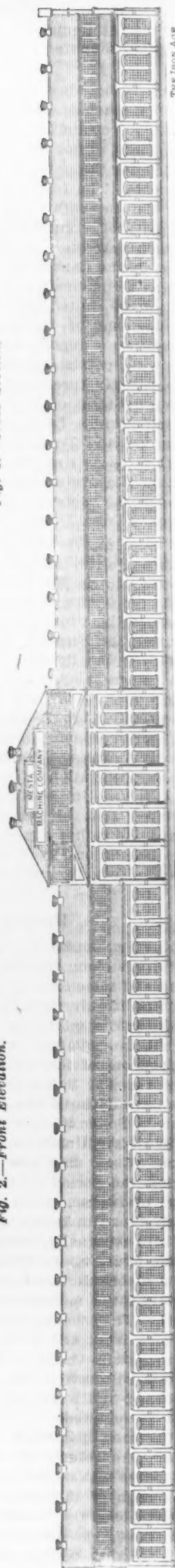


Fig. 4.—Side Elevation.

THE MESTA MACHINE COMPANY.

The Mesta Machine Company.

We present herewith an illustrated description of the large new plant of the Mesta Machine Company, consisting of foundries and machine shops, located at West Homestead, 1 mile from the city of Pittsburgh. The Mesta Machine Company were chartered under the



Fig. 5.—Metal Yard.

laws of Pennsylvania, in November, 1898, being a consolidation of the Robinson-Rea Mfg. Company, whose works were located on the South Side, Pittsburgh, and the Leechburg Foundry & Machine Company, whose works were located at Leechburg, Pa. The Mesta Ma-

also having direct connection with the Baltimore & Ohio Railroad. In addition, the company own 200 feet of river frontage, thus having direct connection with three main lines of railroad and the Monongahela River.

Before entering into a description of the plant, the fact may be noted that the Mesta Machine Company have the distinction of owning the largest individual works in the country building rolls and rolling mill machinery. They are the only manufacturers of rolls making sand, chilled and steel rolls and owning their own steel plant. They have the largest individual air furnace plant in the country, consisting of two 15-ton, two 18-ton and two 30-ton furnaces. They are also manufacturers of machine molded gears, and are the only manufacturers of blowing engines in the Pittsburgh district, where more blowing engines are used than in any other section of the country. The company have a most modern equipment for the manufacture of heavy Corliss engines. The first order taken by them for blowing engines was one of the largest contracts ever placed, and was for five pairs of cross compound condensing horizontal blowing engines for the South Chicago Works of the Federal Steel Company, one of the constituent interests of the United States Steel Corporation. They received this order on the strength of the report of one of the engineers of the Federal Steel Company, after he had made a thorough examination of their plant and facilities for doing such work, although the Mesta Machine Company had never built any blowing engines. These engines, which are said to be heavier than any other engines of the kind ever built, have been in service in the South Chicago Works since July 1, and have given splendid satisfaction. At the present time the Mesta Machine Company are working day and night on some heavy contracts for blowing engines, and have enough orders



Fig. 6.—Foundry.

THE MESTA MACHINE COMPANY.

chine Company commenced the erection of their new plant in November, 1898, on a 10-acre piece of ground, located on the Monongahela River, in the Pittsburgh district, and very close to the Homestead Steel Works. The ground on which the buildings were erected was admirably adapted for the requirements of the company, being located between the Pennsylvania Railroad and the Pittsburgh, McKeesport & Youghiogheny Railroad, and

on hand for this class of work, and also for Corliss mill engines, to keep their large plant in equally full operation for the next eight months.

General Arrangement of Plant.

The general arrangement of the plant of the Mesta Machine Company, as shown in Fig. 1, is different from that of any other similar works in operation at the pres-

ent time. The metal yard, the foundry buildings, the chipping and cleaning buildings, and the machine, or finishing shops, are all placed parallel and directly opposite each other, instead of being placed tandem.

The railroad system, or switches, are as follows: One main track is run parallel to the buildings at a distance of about 100 feet from the building. Switches are run from this parallel track on curves of 100 feet radius, and entering the building at right angles to the length of same, as shown in general plan. By this means the different departments are kept separate; for instance, in

the metal yard by means of the electric traveling crane. This crane is also used for charging the metal and heavy scrap into the furnaces. There is also located in about the center of the yard the chemical and physical laboratory, where all raw materials are tested before they are used. Chemical and physical tests are also here made of each heat, of both iron and steel.

Foundry Department.

The foundry department, Fig. 6, is 125 feet wide by 820 feet long, in which are nine overhead travelling

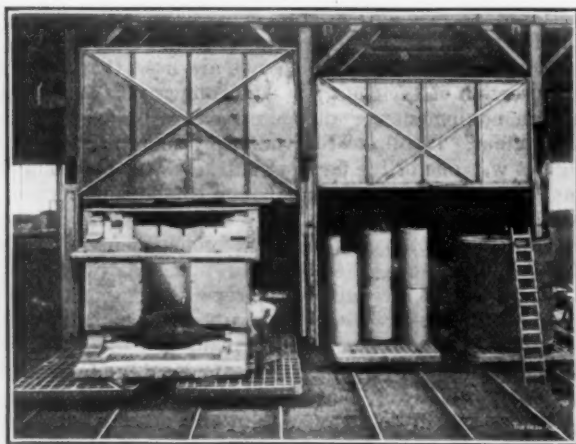


Fig. 7.—Core Oven, Showing Mold of 84 x 66 Corliss Cylinder.

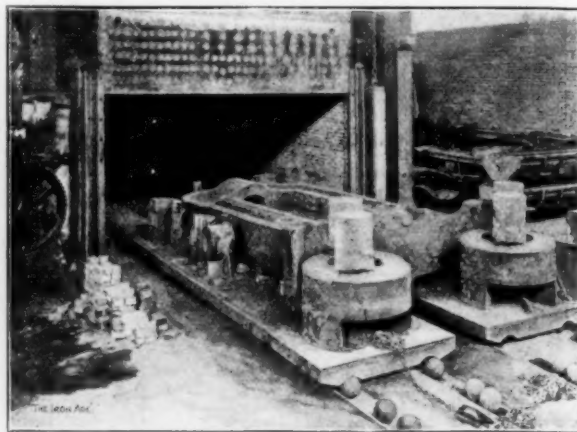


Fig. 8.—Annealing a 50,000-Pound Steel Casting.

the roll department, the metal yard is directly opposite the roll foundry, the cleaning department and the roll turning department. Thus the raw material passes through all of these processes until it is a finished roll, without entering any other department. The finished rolls are also loaded on a car on one of these railroad tracks without entering or going through any other department. This same arrangement is carried out in all other departments. The company have their own switching engine.

cranes, ranging in capacity from 10 to 50 tons. The roll foundry occupies a space of 125 x 180 feet, and contains two 15-ton air furnaces and two 18-ton air furnaces, in which all iron is melted for making rolls. These furnaces are charged by an electric traveling crane direct from the metal yard, and are furnished with coal from a central coal storage, by means of an electric overhead conveyor. This department contains a 10-ton electric crane over the molding floor and a 30 and a 50 ton crane over the main floor. There are also



Fig. 9.—Machine Shop.



Fig. 10.—Roll Turning Shop.

THE MESTA MACHINE COMPANY.

The buildings, which are 820 feet long and together are 210 feet wide, as shown in Figs. 2, 3 and 4, are entirely fire proof, being constructed of structural steel and fire brick. The frame work alone contains over 2000 tons of structural steel. The foundations for the heavy columns, which support the crane girders, are built of concrete and hard burned brick; the crane girders, columns and foundations being designed to carry cranes with 100 tons capacity.

Metal Yard.

The metal yard, as shown in Fig. 5, is 50 feet wide by 820 feet long, covered by a 15-ton overhead electric travelling crane. All material coming into this yard is weighed on a 100-ton track scale, and then unloaded in

several large casting pits, which enable the largest rolls used to be made.

The green and dry sand foundry occupies a space of 210 x 280 feet, and contains two 30-ton air furnaces, one 72-inch cupola and one 84-inch cupola, also necessary drying ovens, core ovens, &c. This department contains overhead traveling cranes ranging in capacity from 10 to 50 tons. All of the important castings, such as Corliss cylinders, engine bed plates, housings, &c., are cast from the air furnaces, and two 30-ton furnaces are so arranged that they can be tapped into one ladle. In this way the company are able to make a 60-ton casting of air furnace iron. At the lower end of this department is a brick molding department where all cylinders and that class of work are cast. Fig. 7 shows several of

these molds ready for the drying room, one being a molding for an 84 x 66 Corliss cylinder. Just opposite this department is a large casting pit, which is of sufficient size to cast a Corliss cylinder 108 inches in diameter.

Gear Foundry.

The gear molding department is located between the iron foundry and steel foundry, thus enabling the molds to be filled with either iron or steel, as may be required. This department contains three patent gear molding machines, which are different from any other machines in use. On these machines the flask in which the mold is to be made is revolved on a table. There are two large housings which support a cross rail, and this cross rail supports a head which contains the pattern. By this

Machine Department.

The machine department is 85 feet wide by 820 feet long, Fig. 9, and contains nine traveling cranes ranging in capacity from 5 to 50 tons. It is divided into roll turning department, Fig. 10, which contains 15 roll lathes; machine tool department, which contains planers, slotters and shapers; another machine tool department, which contains all boring mills, lathes, drill presses, &c., and engine erecting floor, Fig. 11, which has one traveling crane runway 32 feet to the rail and one traveling crane runway 50 feet to the rail. The cranes on the 50-foot rail are used for erecting vertical blowing engines, as engines are now being erected which measure 47 feet from the floor line to the top of cylinders. This department

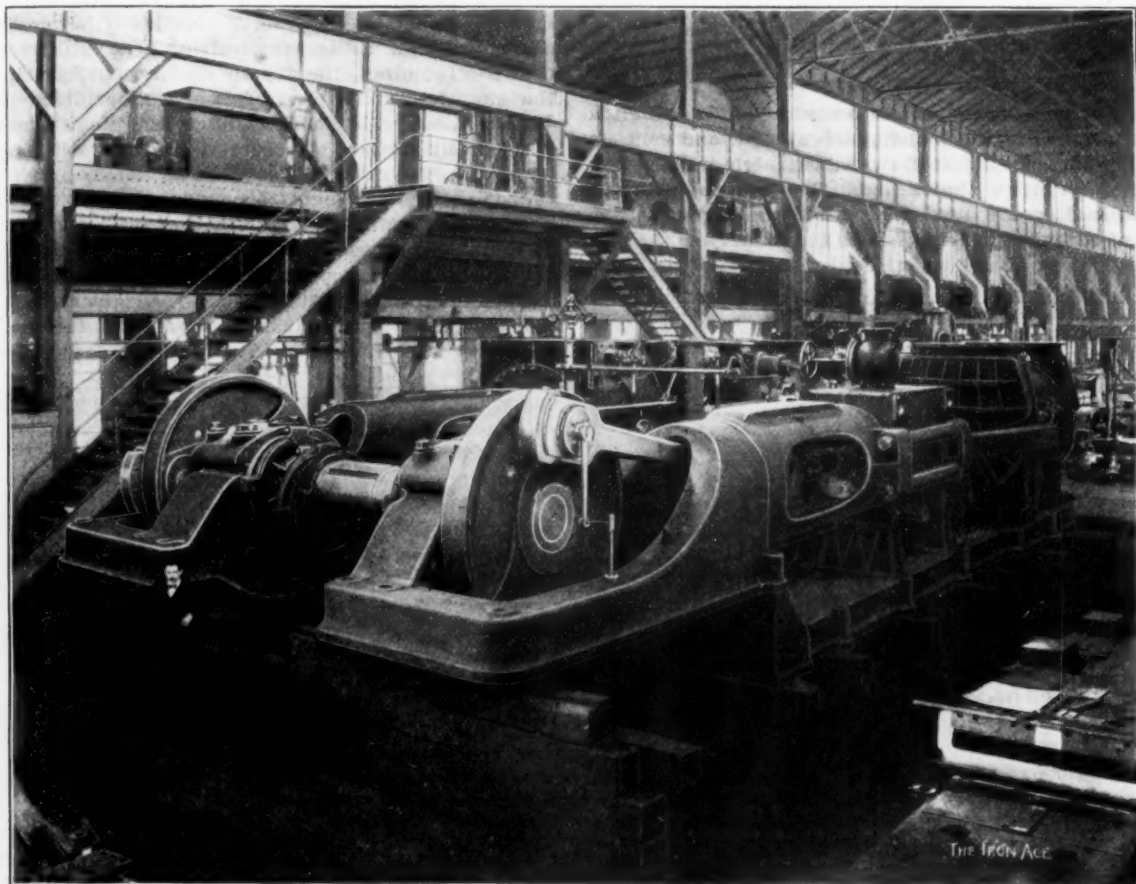


Fig. 11.—Pair of 44 x 84 x 84 x 60 Horizontal Engines in Erecting Shop.

THE MESTA MACHINE COMPANY.

method a gear with a large or small face, or with a large or small diameter, can be made with equal accuracy. The gears and the dividing mechanism of these machines are made partly by the Gleason Tool Company and partly by Brown & Sharpe, and gears made on these machines are guaranteed to be absolutely accurate.

Steel Foundry.

The steel foundry occupies a space of 125 x 280 feet, and contains four overhead electric traveling cranes, and one 25-ton and one 30-ton acid open hearth steel furnace; also the necessary drying ovens, and an annealing oven, which has sufficient capacity to anneal the largest sized casting. Fig. 8 shows the annealing furnace with a 50,000-pound steel casting just turned from the oven. Natural gas is used for fuel in this furnace, and castings as large as 50,000 pounds can be brought up to a bright cherry red, which is necessary to thoroughly anneal them. The company make a specialty of high grade steel castings, such as engine shafts and cranks, housings, rolls, &c., and use only low phosphorus and low sulphur stock, in their open hearth furnace. Opening from the steel foundry is a building 40 x 280 feet for cleaning the castings, also containing cold saws and other machinery for cutting off sink heads.

also has a rolling mill erecting floor where all roll trains, shears, roll lathes, &c., are erected.

The shop is heated with the exhaust steam from the power plant by means of the Sturtevant system, which consists of a number of pipes through which the exhaust steam passes for heating the air and two 12-foot fans, which draw the air from the outside of the buildings over this heating system and force the hot air through galvanized pipe and exhaust it into the building through 82 openings, which are placed about 2 feet from the floor line. This system will keep the temperature of the building up to 65 degrees in zero weather.

The tool room is located in the center of the machine department, and is two stories high. On the first floor all tools are stored and redressed by two Sellers tool grinders. On the second floor all tools are made. This floor contains lathes, shapers, gear cutters, grinding machines, &c.

The blacksmith department, located in the building which adjoins the central portion of the machine department, contains steam hammer, furnaces, forges, &c.

Power Plant.

The power plant, Fig. 12, is located in the center of the buildings, and consists of two 300

horse-power Cahall boilers, two 300 horse-power engines, each direct connected to a 200-kw. Westinghouse generator, and a 150 horse-power Westinghouse gas engine belted to an 85-kw. Westinghouse generator. The current from all the generators is taken into one switchboard, shown in Fig. 12, and from there the power is distributed to all parts of the shop by underground wires laid in conduits. All cranes and all other machinery are driven by Westinghouse motors, the entire plant being operated by electric power.

Electric Traveling Cranes.

The plant contains 20 overhead electric traveling cranes, ranging in capacity from 5 to 30 tons. These cranes were designed by the Wellman-Seaver Engineering Company of Cleveland, Ohio, and all excepting two of the cranes were built in their own shops. The cranes are built entirely of structural steel, and all castings, with few exceptions, are made of steel.

Pattern Department.

The pattern department is located about 50 feet from the upper end of the foundry department, and consists of a building 50 x 100 feet, two stories high, with a wing 25 x 50 feet, two stories high. The two floors in the main building are used for pattern making. The top floor of the wing, which connects the foundry to the pat-

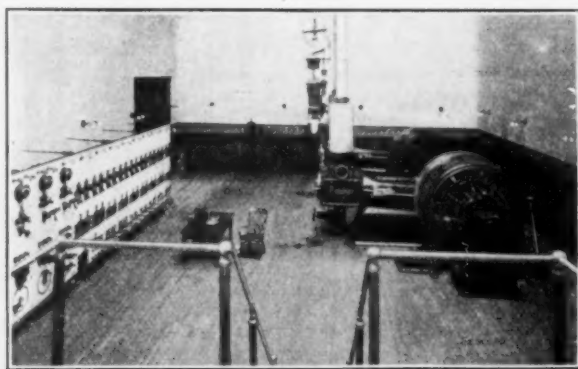


Fig. 12.—Portion of Power Plant, Showing Generators.

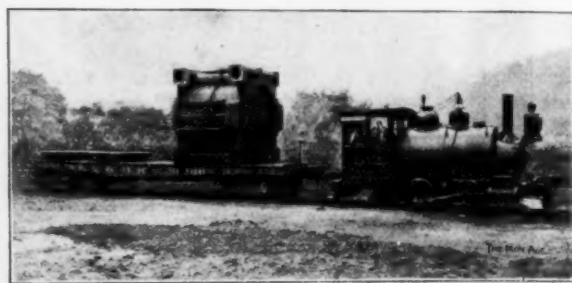


Fig. 13.—Shipping an 84 x 66 Corliss Cylinder.

THE MESTA MACHINE COMPANY.

tern shop, is used for storing patterns which are ready for the foundry, while the lower floor is used for a carpenter shop. There is also a platform in the foundry building upon which the patterns can be placed, so that they can be reached with the traveling cranes.

Products.

The company manufacture all kinds of heavy rolling mill machinery, such as blooming mills, slabbing mills, bar mills, shears, roll lathes, &c.; sand, chilled and steel rolls; machine molded gears made of steel or iron; steel castings; also Corliss engines, vertical blowing engines, horizontal engines and reversing engines.

Office Building.

The office building is located about 50 feet from the main buildings, and is 45 x 90 feet, three stories high, and is of strictly fire proof construction. The first floor contains time office, kitchen, dining room and reading room. The second floor contains the general offices. The third floor contains drafting room and engineers' offices.

The officers of the company are George Mesta, president; J. O. Horning, secretary; W. H. Rea, treasurer, and W. D. Rowan, auditor.

The Tennessee Coal, Iron & Railroad Company have just completed the 27-inch mill in their steel plant at Ensley, Ala., and are now ready to roll sheet bars. They have, in fact, booked a considerable tonnage of sheet bars for delivery beginning in December and running well into next year. They will not begin to roll rails until some time in January.

Test of a New Dynamite Gun.

A new dynamite gun of destructive powers has just been privately subjected to a series of tests at Fisher's Island, N. Y., by a special board of officers of the Bureau of Ordnance of the United States Army. The gun was built by the Dynamite Gun Company of New York at Scranton, Pa. It is a pneumatic piece 40 feet in length with a caliber of 15 inches, of the same general type as those of the batteries now in position at Sandy Hook and at San Francisco, but embodies many new features designed to increase its accuracy of fire and rapidity of action. A new type of fuse is used to insure absolute certainty of the explosion of the shells, both on impact with the water or the side of a vessel, and by delay action.

With the full caliber projectile it proved its ability to hurl 500 pounds of nitrogelatine, sufficient to annihilate any ship afloat, a distance of about 3000 yards, with a degree of accuracy, the experts declare, not excelled by the most improved types of large caliber rifled guns. With smaller projectiles the range was almost doubled without any sacrifice of accuracy. In the test for rapidity of fire, the result is described as amazing, five full caliber shells weighing 1185 pounds, or more than half a ton each being, it is said, discharged in 11 minutes and 35 seconds, almost bringing the weapon within the class of rapid fire pieces. This was accomplished with the disadvantage of an untrained crew of eight men at the gun and two at the magazine, nearly 200 feet distant

from the breech. For endurance the specifications called for the firing in two hours of 25 "air shots," or what in an ordinary gun would be called blank cartridges, but no difficulty was found in discharging 40 shots in that time.

A companion gun has just been mounted in the fortifications at Hilton Head, defending the naval station at Port Royal, S. C., and will be tested by the same board within a few days.

Dr. Hubert Jansen, Berlin (N. W. 7), Dorotheen Strasse, 49, Germany, who is a well-known lexicographer, has been employed as the editor of the "Techno Lexicon," a technical dictionary, in German, English and French, which will be published by the Verein Deutsche Ingenieure. Dr. Jansen is very anxious to receive from American manufacturers copies of their catalogues, price-lists, &c., for the purpose of securing information which he needs in the preparation of this work to enable him to properly set forth the facts required for the English or American department. Quite a number of American firms have already placed their publications at his disposal, but he wishes to secure as full a representation of American industrial matters as possible. The dictionary will be published in three volumes, Vol. I being German-English-French, Vol. II, English-German-French, and Vol. III French-German-English.

The Pressed Steel Car Company of Pittsburgh have received an order from the New York, New Haven & Hartford Railroad Company for 1000 box and 100 flat cars.

The Industrial Commission Extending Its Inquiries.

Margin of Profit in Pig Iron and Steel.

WASHINGTON, D. C., November 12, 1901.—The Industrial Commission has completed a report which in some respects is a departure from the line of work heretofore pursued and which is likely to provoke considerable discussion in the steel trade. The report is designed to show the cost of producing pig iron, steel billets and steel rails, including raw materials and cost of labor and incidentals, together with the selling prices of these products and the margin between the cost and the selling price for the past dozen years. While no attempt is made directly to compare the conditions before and since the important consolidations were effected, the figures given are designed as a basis for such comparison as the Commission may desire hereafter to make. The report will be included among the documents to be transmitted to Congress early next month. Following are liberal extracts from it:

The complexity of the iron and steel industry makes an accurate presentation of the elements of cost in a given product very difficult. The Commission has, however, obtained information from three or four of the leading establishments in the country manufacturing the products named, which shows the amount of the raw materials entering into a ton of pig iron, billets and rails, respectively. Some of the figures submitted for the proportions of the constituents in these products are in the nature of general estimates rather than of minute statistical records, but one or two establishments have submitted data drawn up from long and careful records, and the average of all the establishments represents approximately the average amount of raw material actually required. On the basis of the ascertained monthly or yearly prices of these raw materials the aggregate cost of the quantity required to produce a ton of the respective products has been computed.

The establishments which furnished these statements as to the amount of raw materials required have also given estimates as to the cost of labor and of incidentals in the manufacture of the various products. It should be remarked that the cost of labor and of incidentals in the manufacture of each of the products has been treated as a fixed quantity for each year since 1890. The actual figures given for these costs cover only the most recent period. Beyond question there have been steady improvements in the methods of manufacture tending to reduce the cost of labor and incidentals per unit of product. On the other hand, the advance of wages from 1890 to 1901, no regard to which has been given in making up the figures, may in part offset any reduction through such improvements. It should, of course, be remembered that a large part of the cost of the original raw materials of iron and steel—ore, coke, &c.—is that for labor; but since the raw materials have an ascertainable price, the margin of cost and profit in turning them into pig iron or steel may be computed separately.

Pig Iron.

The three raw materials in the manufacture of pig iron are iron ore, coke (which is used in such large quantities that it may be considered as raw material rather than fuel) and limestone. According to the reports of several establishments to the Commission, the average quantity of Lake Superior ore required to produce a long ton (2240 pounds) of pig iron is 3817 pounds; of coke, 2035 pounds, and of limestone, 1048 pounds. The price of limestone has varied little during the past ten years, and may be taken as approximately 40 cents per ton, plus freight to the mills, which varies according to the distance, but is a comparatively small amount in the aggregate. The average labor cost of making a ton of pig iron from the ore, as reported by the several establishments, is 99 cents, and the average outlay for extras and incidentals is 50 cents. In preparing the figures the three factors of limestone, labor and incidentals have been treated as a fixed amount, aggregating a cost of \$1.68 per ton of product.

The figures given in the table immediately below for

the prices of iron ore as a basis of cost in the manufacture of pig iron are those of Lake Angeline ore at the lower Lake Erie ports. These figures have been furnished by one of the leading establishments manufacturing iron and steel. The prices of iron ore are fixed by yearly periods, and do not fluctuate from month to month in the same manner as the prices of finished iron and steel products.

Prices of Lake Angeline Ore, 1890-1901.

Year.	Price per ton.—Gross.	Year.	Price per ton.—Gross.
1890.....	\$6.06	1896.....	\$4.05
1891.....	4.50	1897.....	2.70
1892.....	4.85	1898.....	2.84
1893.....	3.90	1899.....	3.04
1894.....	2.50	1900.....	5.60
1895.....	2.90	1901.....	4.35

To the prices of iron ore in the computation of costs of producing pig iron has been added \$1 per ton as representing approximately the freight rate from the lake ports, the basis of the prices, to Pittsburgh. This freight rate has varied within comparatively narrow limits above and below \$1 during the past ten years, but owing to the impossibility of ascertaining these variations it has been treated as a fixed quantity.

The prices of coke which have been taken as the basis for estimating the cost both of pig iron and of other products into which coke enters are those f.o.b. Connellsville. These prices have been taken for the years up to 1899, inclusive, from a recent report of the Department of Labor on the prices of products of industrial combinations. For the years 1900 and 1901 the average monthly prices have been computed from the weekly reports in *The Iron Age*. The freight is not considered, but the cost of transporting coke from Connellsville to Pittsburgh is not great, and has not varied materially from year to year, so that the omission of this item of expense would not affect the tables of cost to any extent.

The price of pig iron, with which the cost is compared, is that of Bessemer pig iron at Pittsburgh, the figures up to 1899 being taken from the report of the Department of Labor, those for 1900 from the annual statistical report of the American Iron and Steel Association (from which, indeed, the figures of the Department of Labor are also taken), and those for 1901 from the weekly reports in *The Iron Age*.

Beginning with the year 1890, the report fixes the average cost of the production of pig iron during that year at \$15.50, while the selling price ranged from \$16.60 to \$23.60, and the margin from \$1.10 to \$8.10; in 1891, average cost \$12.77, selling price from \$15.15 to \$16.50, and margin from \$2.38 to \$3.73; in 1892, cost \$13.28, selling price from \$13.90 to \$15.65, and margin from 62 cents to \$2.37; in 1893, cost \$11.39, selling price from \$11.17 to \$13.86, and margin from a loss of 22 cents to a profit of \$2.47; in 1894, cost \$8.65, selling price from \$10.31 to \$13.15, and margin from \$1.66 to \$4.50; in 1895, cost \$9.51, selling price from \$10.06 to \$17.19, and margin from 55 cents to \$7.68; in 1896, cost \$11.93, selling price from \$10.91 to \$13.32, and margin from a loss of \$1.02 to a profit of \$1.39; in 1897, cost \$9.45, selling price from \$9.39 to \$10.77, and margin from a loss of 6 cents to a profit of \$1.32; in 1898, cost \$9.74, selling price from \$10 to \$10.64, and margin from 26 to 90 cents; in 1899, cost \$10.29, selling price from \$11 to \$25, and margin from 71 cents to \$14.71; in 1900, cost \$15.35, selling price from \$13.37 to \$25, and margin from a loss of \$1.98 to a profit of \$9.65. In 1901 the following exhibit is made:

Months.	Cost.	Selling price.	Margin.
January	\$10.82	\$13.15	\$2.33
February		14.43	3.61
March		16.31	5.49
April		16.75	5.93
May		16.30	5.48
June		16.00	5.18
July		15.95	5.13
August		15.37	4.55

Steel Billets.

The chief ingredient of steel billets is pig iron, and the process of changing pig iron into billets is not a very expensive one. It requires, according to the reports of leading establishments, on the average, 2607 pounds of pig iron to make a long ton of billets. To this is

added an average amount of 114 pounds of scrap steel and 19 pounds of ferromanganese. Of coke, on the average, 180 pounds are used, and of coal 580 pounds, per ton of product. The total cost of the raw materials has been ascertained from month to month on the basis of these quantities and of monthly prices. The price of pig iron taken as a basis is that of Bessemer pig at Pittsburgh, the price of coke is that at Connellsville, while the prices of coal and of scrap have had to be taken as at Chicago, since Pittsburgh prices are not available.

The prices of coal used in the figures given below for the years 1890 to 1900 are taken from the annual reports of the Chicago Board of Trade, and are the prices of coal at Chicago. The prices for the year 1901 not being obtainable have been estimated in figuring the cost of billets as equal to those for the year 1900, leaving some margin of error, but not to affect the general figures materially. The prices of scrap steel employed are those at Chicago, which are taken from the weekly reports of *The Iron Age*. The average prices of ferromanganese up to 1900 have been furnished by one of the iron and steel producing establishments, and the average price for 1901 has been computed from *The Iron Age*. The average cost of turning pig iron into a ton of steel billets as reported by the establishments above referred to is \$1.62, and the average incidental expenses 75 cents. These have been treated as fixed factors, and added in determining the cost of steel billets from month to month. The selling price of billets is that in the Pittsburgh market as reported in *The Iron Age* and by the American Iron and Steel Association.

It is important to note, in considering the movement of the prices of steel billets and steel rails, that the margin between cost and price depends almost altogether upon the movement in the price of pig iron. The price of pig iron usually follows largely the price of finished steel products, so that we find the margin between costs and prices of the finished product varying less than the margin between the cost of pig iron and its selling price. Any change in the demand for steel billets or steel rails quickly influences the demand for pig iron and is reflected in its price.

It should be noted further that, while an advance in the price of steel billets or of steel rails may not materially increase the margin above the cost, this does not necessarily show that the manufacturer of billets or rails derives little advantage from an advance and must turn over practically all of the profit to the manufacturer of pig iron. It is a well-known fact that, at least at present, most of the large manufacturers of billets and rails produce also their own pig iron, so that whatever profit arises in the entire process of manufacture from the ore to the billet or rail goes into the same hands.

The cost, selling price and margin of billets are given below, summarized from 1890 to 1900:

Year.	Cost.	Selling price.	Margin.
1890.....	\$24.11 to \$32.17	\$26.25 to \$36.65	\$2.14 to \$4.48
1891.....	22.38 to 23.85	24.16 to 26.25	1.63 to 2.44
1892.....	20.66 to 22.81	22.40 to 25.00	1.26 to 4.09
1893.....	17.14 to 20.50	16.69 to 22.60	.55 to 2.18
1894.....	16.00 to 19.25	15.12 to 18.12	1.13 to .26
1895.....	15.74 to 24.20	14.84 to 24.00	1.11 to .16
1896.....	16.78 to 19.70	16.80 to 20.00	1.84 to 2.52
1897.....	14.11 to 16.53	13.82 to 16.44	1.23 to .73
1898.....	15.68 to 16.44	14.50 to 16.00	1.56 to .24
1899.....	16.86 to 33.74	16.62 to 38.75	-.24 to +7.02
1900.....	20.14 to 34.08	16.80 to 34.50	-5.03 to +1.4

Following are details by months for 1901:

Months	Cost.	Selling price.	Margin.
January	\$19.85	\$19.75	—\$0.10
February	21.34	20.31	—1.03
March	23.60	22.87	—73
April	24.16	24.00	—16
May	23.60	24.00	.40
June	23.20	24.37	1.17
July	23.09	23.90	.81
August	22.39	24.37	1.98

Steel Rails.

The constituent materials used in the manufacture of steel rails are pig iron (by far the most important), spiegeleisen (which sometimes is replaced by ferromanganese), coke and coal. A leading establishment reports the average amount of pig iron required to produce a ton

of rails at 2761 pounds; of spiegel, 154 pounds; of coke, 32 pounds, and of coal, 550 pounds. The same establishment reports the cost of labor in transforming pig iron into a ton of rails at \$1.65, and of extras at 75 cents. For the purpose of ascertaining the cost of the raw materials from month to month the prices have been taken on the same basis as indicated in regard to steel billets. The explanation regarding the significance of the movement in cost of rails depending upon the movement in the price of pig iron, which has been presented in the discussion of steel billets, must be borne in mind in considering the figures for steel rails. In the following figures a column has been added showing the aggregate of the margins on both pig iron and rails, which, as already suggested, usually go into the same hands:

Year.	Cost. Dollars.	Price. Dollars.	Margin. Dollars.	Sum of margin on pig iron and on rails. Dollars.
1890....	25.93 to 34.52	28.50 to 35.25	0.73 to 6.08	3.67 to 8.83
1891....	24.15 to 25.68	29.00 to 30.10	3.89 to 5.85	7.07 to 8.58
1892....	22.65 to 24.82	30.00	4.68 to 7.35	6.65 to 7.97
1893....	19.25 to 22.62	24.00 to 29.00	4.75 to 8.49	4.97 to 9.33
1894....	17.79 to 21.29	24.00	2.71 to 6.21	7.21 to 7.87
1895....	17.46 to 25.47	22.00 to 28.00	1.10 to 9.06	5.32 to 11.42
1896....	17.72 to 20.69	28.00	7.31 to 10.28	8.70 to 9.26
1897....	15.91 to 17.62	18.00 to 25.00	.47 to 7.38	1.00 to 8.70
1898....	16.67 to 17.81	17.00 to 18.00	-.05 to +1.33	.51 to 1.59
1899....	18.11 to 35.52	18.50 to 35.00	-1.51 to +2.63	1.10 to 14.26
1900....	21.83 to 36.12	26.00 to 35.00	1.00 to 9.86	2.02 to 10.58

Following are details by months for 1901:

Months.	Cost.	Price.	Margin.	Sum of margin on pig iron and on rails.
January	\$21.54	\$26.00	\$4.46	\$6.79
February	23.14	26.00	2.86	6.47
March	25.53	26.00	.47	5.96
April	25.98	26.50	.52	6.45
May	25.41	28.00	2.59	8.07
June	25.05	28.00	2.95	8.13
July	24.99	28.00	3.01	8.14
August	24.28	28.00	3.72	8.27

Without attempting to discuss in detail the causes of the various movements in costs, prices and margins, a few significant points may be indicated. Probably the most conspicuous fact shown is the very rapid and wide variations in the prices of all three of the products compared, and most of all in the prices of pig iron. Even in earlier years, not covered by the figures, the price statistics show similar sharp fluctuations. The figures herewith presented bring out the great and sudden decline in the prices of all three products during the year 1890. This was followed by a long and gradual fall, which brought the price of pig iron down from \$16 at the beginning of 1891 to \$10 at the end of 1894. A sudden sharp rise in the prices of all three products is seen in 1895, but this was followed by an almost equally rapid decline, and during 1897 and 1898 the prices stood practically at a bottom figure. The most noticeable movement shown is that during 1899, when the price of pig iron rose from \$10 to \$25, and the price of rails from \$17 to \$35. Almost equally sudden and very great, however, was the decline in the prices of these products, especially billets and pig iron, during the latter part of 1900. Since that time there has been a recovery, which leaves the prices of all three products considerably higher than for the years 1890 to 1898.

These often sudden and violent fluctuations show, among other indications, the great changes in demand for iron and steel products from time to time, and the marked sensitiveness of prices to such changes in demand. No very large stock of iron and steel is usually held in advance, and when a period of prosperity causes a great extension in the use of these products the mills find themselves often temporarily unable to keep pace with the demand, while buyers, under certain conditions, are willing to pay almost any price.

The point must not be forgotten in considering these figures that, to a very large extent, the producers of steel billets and of steel rails produce also the pig iron which enters into them. If the increase in the price of the steel products drags with it the price of pig iron, so as to leave little margin between the cost of the steel and the selling price, the profit on the entire process nevertheless

goes often into the same hands. A similar argument, of course, applies, as regards the effect of a decline in prices or cost. A study of the sum of the margins on both pig iron and rails will, therefore, be desirable in judging the significance of the figures.

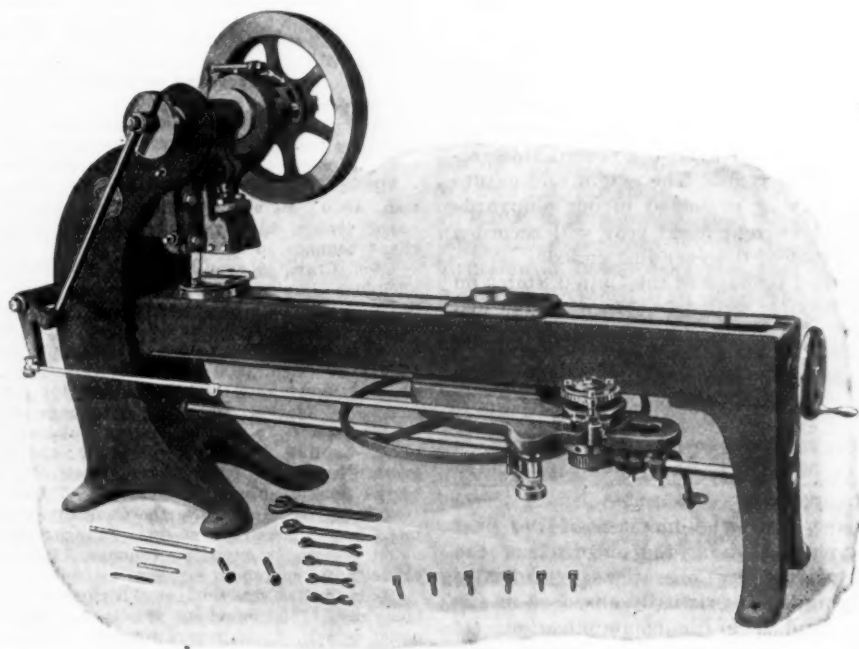
W. L. C.

The Ferracute Armature Disk Notching Press.

The Ferracute Machine Company of Bridgeton, N. J., are building their newly designed armature disk notching press in three sizes. The first will work disks from 2 to 48 inches in diameter, the second from 14 to 84 inches, and the third from 26 to 120 inches. The machine will cut any of these sizes from square sheets, at the same time it notches them, by the use of proper L-shaped dies, ample throat having been provided for the square corners to pass. These presses contain various improvements not heretofore embodied in such machinery. Among them is a system of change ratchets and pinions, which, by permutation, allow a large number and variety of notches to be cut, and yet which avoid

will, when used by picking up any desired number of teeth and using a proper ratio of the large gear to a certain one of the different pinions, produce many hundreds or thousands of different notch numbers. Each size of machine is provided with a 30-tooth pinion and a 45-tooth ratchet. Other ratchets and pinions can be provided instead of the regular ones, or additional ones can be supplied.

The press also contains the following features: An automatic clutch stop for stopping the press after one revolution of the disk; a screw feed provided with hand wheel and crank for accurately adjusting the carriage on the bed, thus regulating to a nicety the depth of the notch; an elevating die chuck to keep the die at the right level, regardless of any inaccuracies in its original height, and of subsequent wear or grinding down; a ram provided with a slot and set screws which will hold punches of simple shape made from a plain bar of steel; a newly designed clamping stripper made from commercial sheet rubber; a 3-inch adjustment up and down for ram; a chute for delivering scrap outside the machine, and a convenient and accurate method of fasten-



THE FERRACUTE ARMATURE DISK NOTCHING PRESS.

on the one hand evils due to a large and expensive dial for each number it is desired to cut, and on the other hand the inaccuracies of indexing due to the numerous gears in a train; where the errors are augmented by the addition of those in each tooth and each journal of the various wheels through which the motion must be passed. In this machine a gear of very large diameter, keyed securely upon the spindle which carries the disk to be notched, is driven direct by the small pinion upon the ratchet spindle, the other end of which carries the ratchet, which is operated by a pawl lever, driven from an adjustable crank upon the main shaft, through one light rock lever, and from a light telescopic pitman made of bicycle tubing. The overrun due to momentum is controlled by an accurate self adjusting brake, operating upon the rim of the gear—far out from the axis. This arrangement allows accurate indexing to be done, even at as high a speed as 200 per minute for work of rather small diameter.

The change ratchets are so designed that they consist of a simple steel ring, usually 6 inches, but sometimes 12 inches in diameter, with the required number of teeth accurately cut in the edge. This ring can be changed for other rings in a few seconds, being held by a clamp with a mutilated thread, after the manner of a cannon breech block. Being of this simple form, a number of these ratchets can be cheaply provided which

ing center plates securely on disk spindle by means of one bolt.

Pittsburgh Valve, Foundry & Construction Company.—The large new foundry being built by the Pittsburgh Valve, Foundry & Construction Company, at Twenty-sixth street and Allegheny Valley Railway, is rapidly nearing completion and will be occupied in a short time. This foundry is one of the largest in the Pittsburgh district, and is equipped with modern appliances throughout. It is the intention of the company to centralize their foundry operations in the new plant, and when it is ready for operation the foundries downtown, now connected with the Atwood & McCaffrey works and Shook-Anderson Mfg. Company and the foundry of A. Speer & Sons, will be abandoned. The Pittsburgh Valve, Foundry & Construction Company were organized about a year ago and issued capital stock to the amount of about \$1,150,000. G. E. Klingelhofer has retired as general manager and has been succeeded by C. R. Rhodes, formerly with the Shook-Anderson Mfg. Company. The new company acquired the plants of Atwood & McCaffrey, Pittsburgh Valve & Machine Company, Limited; Shook-Anderson Mfg. Company, the pipe fitting department of Wilson-Snyder Mfg. Company and the foundry of A. Speer & Sons. The officers of the concern are Henry M. Atwood, president; J. T. Speer, vice-president;

C. A. Anderson, treasurer, and Moses Atwood, secretary and general sales agent. The company are engineers, founders, pipe fitters and machinists, and do a general business in steam piping for high pressure power plants. They also make all kinds of pipe, globe and gate valves, fittings and appliances for steam, water and hydraulic work.

American Shipbuilding.

WASHINGTON, D. C., November 5, 1901.—The report of Commissioner of Navigation E. T. Chamberlain, for the fiscal year 1901, which has just been completed, contains some unusually interesting statistics with regard to the great increase in shipbuilding during the past year, and especially concerning the employment of steel in the construction undertaken by American shipyards and which it is assumed will be finished before June 30, 1902. These advance figures will be examined with special interest as they are the only data available in any quarter giving an authoritative estimate of the steel construction now under way, and which promises to far exceed the record of the past fiscal year. With regard to the record of 1901 in vessel construction of all kinds, Mr. Chamberlain says:

The fiscal year ended June 30, 1901, has been the third year of notable prosperity and growth in the shipbuilding and ship owning industries of the United States and of the whole world. In every essential respect the record at home has surpassed even the remarkable records of the two preceding years. The extent and nature of the work under way or projected in our shipyards gives promise that the current fiscal year will record a greater growth than that of the year just ended.

The total documented tonnage of the United States on June 30, 1901, has been exceeded but once in our history—on June 30, 1861. The elements of growth and decline are:

	1861. Tons.	1901. Tons.	Difference. Tons.
Foreign trade.....	2,496,894	879,595	1,617,299
Coasting trade.....	2,704,544	4,582,683	1,878,139
Fisheries	338,375	61,940	276,435
Totals.....	5,539,813	5,524,218	15,595

While our tonnage, with the increase of the past three months, is greater than at the outbreak of the Civil War, the nature of its operations is radically changed. Our shipping is now virtually absorbed in our systems of internal and domestic communication. Of the total, 3,623,201 tons are still wooden vessels, and only 1,901,017 iron or steel vessels.

The total tonnage built in the United States during the past fiscal year was the greatest in our history, except during the years 1854 and 1855. The elements of growth and decline are:

	1855. Tons.	1901. Tons.	Difference. Tons.
Sail, &c.....	510,690	209,998	300,792
Steam	72,760	273,591	200,831
Totals.....	583,450	483,489	99,961

The most unusual change which has taken place since the last report is the extent of increase in tonnage of registered steel steamers. By the end of the current fiscal year possibly half our tonnage in foreign trade for the first time will be steel steamers, the instrument of commerce which for some years has been chiefly employed by foreign nations. On June 30, 1901, the merchant marine of the United States, including all kinds of documented shipping, amounted to 24,057 vessels, of 5,524,218 gross tons. On June 30, 1900, it comprised 23,332 vessels, of 5,164,839 gross tons. The steel construction in 1901 consisted of 101 steam vessels, with a gross tonnage of 236,128 tons; 12 sail vessels, with a tonnage of 21,746 tons, and 4 barges with a tonnage of 4825 tons, while the record of 1900 included 80 steam vessels, with a gross tonnage of 167,948 tons, and 10 sail vessels, with a tonnage of 28,903.

Construction during the fiscal year promises nearly, if not quite, to equal the greatest in our history. In 1855 we built 583,000 tons. The strike in the shipping trade about the end of the past fiscal year delayed work on some vessels nearing completion, which under ordinary

conditions would have been included in last year's figures. Four large steamers for the Pacific, aggregating over 60,000 tons, will have been under contract for two years and should be completed before next July. Two of these, "Korea" and "Siberia," the finest vessels yet designed by any nation for trade with Asia, have been launched. In the winter and early spring, when the passage of shipping legislation seemed probable, contracts were made for eight large steamers, and part of this tonnage will be completed before the close of the current fiscal year.

American builders of steam vessels were requested to make a return on June 15, 1901, of the merchant vessels under construction or contract in their establishments, and from the Navy Department, Revenue Cutter and Light House Board statements were obtained showing the steel vessels for these services, respectively, under construction in private yards. A summary of the replies received from 46 establishments, supplemented by official information of Government construction, is given below. Although all builders were requested to state the capital employed in their business, the number of men and the maximum capacity of their yards for the production of merchant tonnage, a number failed to furnish these figures. The statistics furnished are as follows:

Merchant and Government.

Newport News Shipbuilding & Dry Dock Company, Newport News, Va.—Capital, not given; men, 7000; merchant vessels, 5; aggregate tonnage, 36,595 tons; naval vessels, 7; tonnage, 79,038 tons; maximum merchant capacity, not given.

Union Iron Works, San Francisco, Cal.—Capital, not given; men, 4000; merchant vessels, 3; aggregate tonnage, 19,150; naval vessels, 11; aggregate tonnage, 57,435; maximum merchant tonnage, 60,000.

Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia.—Capital, \$12,000,000; men, 7000; merchant vessels, 3; aggregate tonnage, 28,500; naval vessels, 3; aggregate tonnage, 39,660; maximum merchant capacity, not given.

Maryland Steel Company, Sparrow's Point, Md.—Capital, \$2,500,000; men, 2500; merchant vessels, 4; aggregate tonnage, 41,820; naval vessels, 3; aggregate tonnage, 1299; maximum merchant capacity, 6; aggregate tonnage, 40,000.

Neafie & Levy Ship & Engine Building Company, Philadelphia.—Capital, \$800,000; men, 1340; merchant vessels, 3; aggregate tonnage, 1035; naval vessels, 5; aggregate tonnage, 14,160; maximum merchant capacity, 7200.

Harlan & Hollingsworth Company.—Capital, \$2,000,000; men, 2000; merchant vessels, 7; aggregate tonnage, 13,860; naval vessels, 3; aggregate tonnage, 1168; maximum merchant capacity, 0; aggregate tonnage, 20,000.

William R. Trigg Company, Richmond, Va.—Capital, \$3,000,000; men, 1100; merchant vessels, 2; aggregate tonnage, 1405; naval vessels, 6; aggregate tonnage, 5435; maximum merchant capacity, 12; aggregate tonnage, 15,000.

Burlee Dry Dock Company, Port Richmond, Staten Island, N. Y.—Capital, not given; men, 600; merchant vessels, 6; aggregate tonnage, 2630; naval vessels, 2; aggregate tonnage, 1403; maximum merchant capacity, 3; aggregate tonnage, 15,000.

Spedden Shipbuilding Company, Baltimore, Md.—Capital, not given; men, 350; merchant vessels, 1; aggregate tonnage, 250; naval vessels, 1; aggregate tonnage, 538; maximum merchant capacity, 4; aggregate tonnage, 1000.

Total.—Capital, \$20,300,000; men, 25,890; merchant vessels, 34; aggregate tonnage, 145,245; naval vessels, 41; aggregate tonnage, 200,136; maximum merchant capacity, 46; aggregate tonnage, 158,200.

Merchant Only.

New York Shipbuilding Company, Camden, N. J.—Capital, not given; men, 4000; merchant vessels, 7; aggregate tonnage, 62,200; maximum merchant capacity, 7; aggregate tonnage, 50,000.

Eastern Shipbuilding Company, New London, Conn.—Capital, \$900,000; men, 1500; merchant vessels, 2; aggregate tonnage, 42,000; maximum merchant capacity, aggregate tonnage, 30,000.

Arthur Sewall & Co., Bath, Maine.—Capital, \$200,000; men, 250; merchant vessels, 3; aggregate tonnage, 9900; maximum merchant capacity, 4; aggregate tonnage, 14,000.

John H. Dialogue & Son, Camden, N. J.—Capital, not given; men, 600; merchant vessels, 5; aggregate tonnage, 6760; maximum merchant capacity, not given.

Delaware River Iron Shipbuilding & Engine Works, Chester, Pa.—Capital, not given; men, 250; merchant vessels, 1; aggregate tonnage, 4500; maximum merchant capacity, 10; aggregate tonnage, 40,000.

T. S. Marvel & Co., Newburg, N. Y.—Capital, \$200,000; men, 400; merchant vessels, 6; aggregate tonnage, 1683; maximum merchant capacity, 3000.

Merrill-Stevens Engineering Company, Jacksonville, Fla.—Capital, \$200,000; men, 175; merchant vessels, 3; aggregate tonnage, 877; maximum merchant capacity, 8; aggregate tonnage, 2500.

Pusey & Jones Company, Wilmington, Del.—Capital, \$700,-

900; men, 600; merchant vessels, 2; aggregate tonnage, 700; maximum merchant capacity, 3000.

Total.—Capital, \$2,200,000; men, 7775; merchant vessels, 29; aggregate tonnage, 128,620; maximum merchant capacity, 37; aggregate tonnage 142,500.

Government Only.

Fore River Ship & Engine Company, Weymouth, Mass.—Capital, not given; men, not given; naval vessels, 5; aggregate tonnage, 33,896; maximum merchant capacity, not given.

Bath Iron Works, Bath, Maine.—Capital, not given; men, not given; naval vessels, 6; aggregate tonnage, 21,884; maximum merchant capacity, not given.

Moran Bros. Company, Seattle, Wash.—Capital, \$1,350,000; naval vessels, 2; aggregate tonnage, 15,678; maximum merchant capacity, 12,000.

Lewis Nixon (Crescent Shipyard), Elizabethport, N. J.—Capital, not given; men, not given; naval vessels, 9; aggregate tonnage, 7383; maximum merchant capacity, not given.

Gas Engine & Power Company and Chas. L. Seabury & Co., Consolidated.—Capital, \$1,000,000; men, 800; naval vessels, 2; aggregate tonnage, 585; maximum merchant capacity, not given.

Petersburg Iron Works Company, Petersburg, Va.—Capital, not given; men, not given; naval vessels, 1; aggregate tonnage, 495; maximum merchant capacity, not given.

Iowa Iron Works Company, Dubuque, Iowa.—Capital, not given; men, not given; naval vessels, 1; aggregate tonnage, 346; maximum merchant tonnage, not given.

Geo. Lawley & Son Corporation, South Boston, Mass.—Capital, not given; men, not given; naval vessels, 2; aggregate tonnage, 332; maximum merchant tonnage, not given.

Wolff & Zwicker Iron Works, Portland, Ore.—Capital, not given; men, not given; naval vessels, 1; aggregate tonnage, 248; maximum merchant capacity, not given.

Columbian Iron Works & Dry Dock Company, Baltimore, Md.—Capital, not given; men, not given; naval vessels, 1; aggregate tonnage, 165; maximum merchant tonnage, not given.

Total.—Capital, \$2,350,000; men, 1700; naval vessels, 30; aggregate tonnage, 81,012; maximum merchant capacity, 12,000.

Great Lakes.

American Shipbuilding Company, Cleveland, Ohio.—Capital, not given; men, 2300; merchant vessels, 10; aggregate tonnage, 41,150; maximum merchant capacity, 10; aggregate tonnage, 45,000.

Detroit Shipbuilding Company, Detroit, Mich.—Capital, \$1,500,000; men, 1200; merchant vessels, 6; aggregate tonnage, 19,940; maximum merchant capacity, 12; aggregate tonnage, 50,000.

Chicago Shipbuilding Company, Chicago, Ill.—Capital, not given; men, 1000; merchant vessels, 2; aggregate tonnage, 10,000; maximum merchant capacity, 8; aggregate tonnage, 30,000.

Superior Shipbuilding Company, West Superior, Wis.—Capital, \$800,000; men, 600; merchant vessels, 1; aggregate tonnage, 4000; maximum merchant capacity, 30,000.

Craig Shipbuilding Company, Toledo, Ohio.—Capital, not given; men, 600; merchant vessels, 3; aggregate tonnage, 3550; maximum merchant capacity, 8; aggregate tonnage, 15,000.

Buffalo Dry Dock Company, Buffalo, N. Y.—Capital, not given; men, 800; merchant vessels, 2; aggregate tonnage 3140; maximum merchant capacity, 4; aggregate tonnage, 16,000.

David Bell Engineering Works, Buffalo, N. Y.—Capital, \$30,000; men, 80; merchant vessels, 2; aggregate tonnage, not given; maximum merchant capacity, not given.

Total.—Capital, \$2,330,000; men, 6580; merchant vessels, 26; aggregate tonnage, 81,780; maximum merchant capacity, 52; aggregate tonnage, 186,000.

Summary.

Total, Capital, \$27,180,000; men, 41,945; merchant vessels, 89; aggregate tonnage, 355,645; naval vessels, 71; aggregate tonnage, 281,148; maximum merchant capacity, 135; aggregate tonnage, 488,700.

The returns of capital invested are very incomplete, but on the basis of reports made this year and last year the capital actually invested approximates \$65,000,000, and the number of men directly employed is about 46,000. The value of the merchant vessels covered in the figures given above is approximately \$41,000,000, and the naval contracts call for an expenditure of \$78,000,000. It is to be noted, however, that the expenditures for naval construction cover in some instances a period nearly four years, while the expenditures for merchant construction will only in rare instances cover so long a period as two years. On the seaboard the amount of steel construction of war vessels in our private yards will considerably exceed the amount of construction of steel merchant vessels. The figures given above show 89 steel merchant vessels, of 355,645 gross tons, under construction or contract at the beginning of the current fiscal year. At the beginning of the past fiscal year a similar return showed 68 steel steam vessels, of 277,680 tons, under construction.

A very graphic exhibit is made by tabulating the ocean steel screw steamers of over 1000 tons built last year and building this year in the United States. These

figures appear to promise that 33 steel screw ocean steamers, of 255,325 gross tons, will be built in the United States this year, compared with 25, of 95,242 gross tons, for the past year. This promise will not be made wholly good, but, barring strikes or other unforeseen causes, it is reasonably certain that nearly 200,000 gross tons will be added to our ocean steel steam fleet before July 1, 1902—a tonnage equal to 70 per cent. of the recent Leyland purchase by Americans.

The possible addition of ten steamers, of 110,800 tons, to our transatlantic fleet within 12 months presumably rests on anticipated legislation by Congress. Eight of these steamers are building for the International Navigation Company and the Atlantic Transport Line, which have just built or are building corresponding vessels at less cost in British shipyards and own large fleets under foreign flags. The successful legislative project of admitting to registry foreign built steamers on condition that corresponding vessels be built in the United States, begun with the "New York" and "Paris" (now "Philadelphia"), and of immediately establishing by this means American ocean mail lines, has never been carried to its logical conclusion. The intelligent sentiment in favor of that project has steadily grown. Whether or not the steamers just referred to are building in anticipation of such legislation, it is certain they furnish the opportunity, by such legislation, to give the United States within two years an appearance on the North Atlantic equal to that of any one of the four great British or German North Atlantic corporations, of which we now fall far short.

While it may prove costly to builders or owners, or both, the experience derived from the extensive construction of large ocean steamers now under way cannot fail ultimately to be of advantage to American shipping industries. Matters of comparative cost of construction here and abroad, and of comparative cost of operation, will be tested under identical conditions on so large a scale as to admit of no doubt as to the facts.

Relative Cost of Construction.

For several years past the reports of the bureau have contained such information concerning the relative cost of building steel steamers in the United States and in Great Britain as could be secured. This information has not been altogether satisfactory, because so few ocean steel steamers have been built in the United States that comparisons were almost impossible. During the current fiscal year, however, ocean steamers are being built, or have just been built, in the United States and Great Britain from similar plans for the Atlantic Transport and International Navigation companies. The prices of these steamers are as nearly as possible an accurate measure of the difference in the cost of construction in the United States and Great Britain. The following letter from B. N. Baker of Baltimore, president and owner of a large majority of the shares of the Atlantic Transport Line, gives conclusive evidence on the matter:

ATLANTIC TRANSPORT LINE, OFFICE OF THE PRESIDENT.

BALTIMORE, October 17, 1901.

DEAR MR. CHAMBERLAIN.—Referring to my letter of March 16, 1901, and replying to your request with regard to relative difference in cost of ships, our company at present have a contract for two ships with Harland & Wolff, Limited, Belfast (one of which will be completed very early in the spring and the other a little later, say during the summer), of exactly the same size, dimensions and all particulars as two ships we have contracted for with the New York Shipbuilding Company of Camden. The cost of the English built ship, as near as possible (we having just completed two of exactly the same size, dimensions and speed), will be about £292,000 (\$1,419,120). The same identical ship built at the works of the New York Shipbuilding Company will cost us a little over £380,000 (\$1,846,800).

In addition to this, we are building two steamers with the New York Shipbuilding Company of smaller dimensions, for which we have a contract, at £150,000 each (\$729,000); also two ships of exactly the same dimensions with the Maryland Steel Company, Sparrow's Point, for £150,000 each (\$729,000). We have two ships of identically the same detail, delivered to us in the last 12 months, built by Harland & Wolff, Belfast, one of which cost me £110,000 (\$534,000) and the other £100,000 (\$486,000).

Very truly yours,

B. N. BAKER, President.

EUGENE T. CHAMBERLAIN, Esq., Commissioner of Navigation
Washington, D. C.

The larger and faster vessels referred to as costing, respectively, \$1,846,800 and \$1,419,120 are 16-knot steamers of about 13,000 tons, of the type of the "Minneapolis" and "Minnehaha," steamers which became well known to the traveling public during the past summer. The difference in cost of such a steamer built here and in Great Britain is thus \$428,000 in round numbers. The smaller and slower steamers referred to as costing \$729,000 and \$534,600 and \$486,000, respectively, are cargo steamers of about 11 knots, for the North Atlantic cattle trade, of about 8000 gross tons (9000 including shelter deck spaces, or, say, 10,500 dead weight). Such a steamer built here is costing \$194,000 more than the dearer British vessel and \$243,000 more than the cheaper British vessel.

W. L. C.

Controlling the Contraction of Metals While Casting.*

BY WILLIAM D. ALLEN.

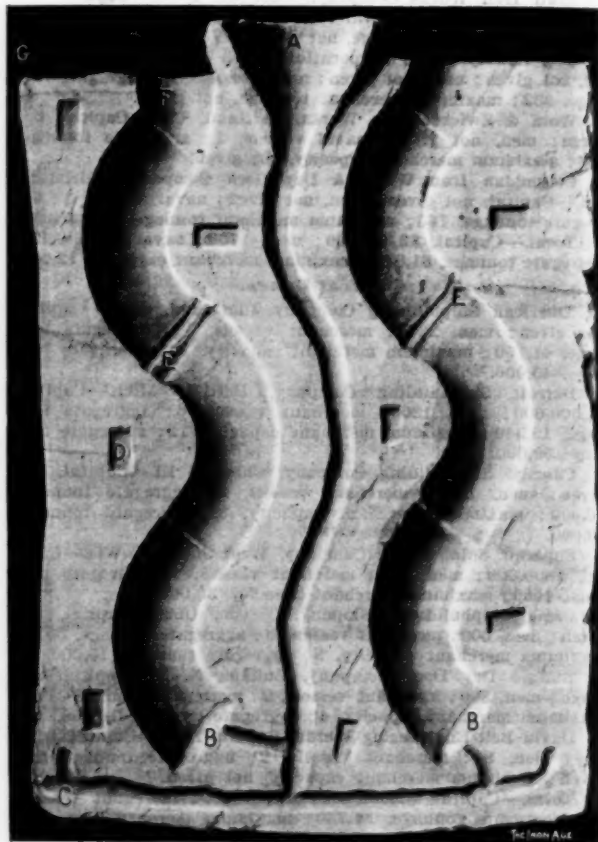
In entering upon this subject permit me to state that this process, in the controlling of contraction, is a radical departure from the former mode of metal casting, which consists of providing heads, gates and other means known to the intelligent artist, to compensate for the contraction when passing from the molten to the cool state too often in difficult work proving a failure. With this process of metal casting the contraction, even in metals which possess this to the greatest degree, is easily controlled. I believe aluminum in its most refined state undergoes quite as great a change in cooling as any of the metallic elements, and yet when cast by this process it yields perfect obedience to this law, intelligently applied.

It is a fact that one of the most difficult of all castings is a dental plate cast of pure aluminum, owing to the great contraction of this metal and the many fine lines, sharp angles and the thinness of the plate where it covers the roof of the mouth; yet with this process the casting is accomplished without difficulty. In the wide field of the lower fusing metals, such as copper, aluminum, zinc and tin and their many alloys, I believe this process will be found of much value. The custom that now prevails in the production of so many castings with these metals is to use a superabundance of metal at certain parts of the casting, thereby causing the piece to cool last at these points and to give the required strength there, and in the greater portion of these castings, if you part them along these thick places, a state of porosity or cavities will be found and you are compelled to use this excess of metal. In this connection let me say that the strongest, or that part of a casting with its greatest resistance to strain, is no better than its weakest parts, and it must follow that a casting uniformly perfect throughout, the molecules being nicely adjusted, though there is considerably less metal in the piece, is more to be relied upon than one with hidden defects. Then each run must have its fresh molds skillfully prepared in sand or like substance, thus requiring highly paid artisans to do this work.

To illustrate we will take molds for couplings, nuts and like castings. These molds are preferably in halves, Fig. 1, each half forming its part of the mold and conduit, having as many mold chambers as is desired, say six mold chambers with a conduit, A, in the center leading from the top to the bottom, with passages, C, into each mold chamber, through which each chamber is supplied with molten metal. With castings of this character ordinary cast iron piping can be used to fashion the core on, using it for the barrel of the core with perforations for the escape of gases. These should be dried, of course, before use. The core being hollow will admit of more rapid heating and will expedite the cooling after the cast when the heat is being withdrawn. Should the couplings or other castings to be made possess curves and angles hemp may be used in the center of the core, which will burn out and leave passages for the escape of the gases. The molds should be carved as thin as practicable and made to conform to the contour of the

casting to be made. The spaces between the mold chambers should be thick enough to guard against warpage and to cool about as rapidly as the molds with their molten metal, as the heat is being withdrawn. There should be ample slots, D, loops and keys to hold the parts when assembled firmly together. Trunnions and legs can be placed where most convenient for handling. These molds may be 4 or 5 feet high if so desired, since the number of pieces cast at one pouring will depend upon the length of the molds. When short pieces, such as ordinary couplings, are to be cast, it will readily be seen how great a number of pieces can be made with one pouring, where each mold contains six chambers and the furnace will accommodate three of these molds at one pouring.

When these molds with their contents have sufficiently cooled to be removed they may be taken from the furnace and others placed in to receive like treatment. The fact that an "open top mold chamber or like vessel" is



CONTROLLING THE CONTRACTION OF METALS WHILE CASTING.

mentioned in the specifications does not follow that this must invariably be so. If provision is made for an ample surplus of molten metal and the admittance of air at the uppermost part of the mold, when it is of metal, the air will fill the space caused by the falling metal as it contracts in cooling, and the same result is obtained as with an open top mold. If there is a disposition on the part of the molten metal to adhere to the walls of the molds or core walls this can be obviated by a very thin wash of alumina, 3 parts, and gypsum 1 part. While the gypsum fuses at a comparatively low heat, yet there is so little in the mixture that it does not seem to be a disadvantage. This small quantity of gypsum prevents the alumina from checking or cracking and enables it to cling to the walls of the molds.

A vertical section of a furnace for this work is shown in Fig. 2. The mold H is inclosed in the casing C. Surrounding the mold chamber are the gas burners arranged one above the other and which are controlled independently through the gas pipes N. Top and bottom burners, B and E, are provided and also the cap F. The planes of the burners should be so fashioned as to follow the general outlines of the molds that the heat serv

* Abstract of paper read at the Foundrymen's Association of Philadelphia.

be may be uniform. The chambers for these planes of burners should be cast separate, and after the apertures are made to admit the heating fluid they can be set in the inner walls of the furnace, commencing at the base, placing one over the other until the top is reached, the supply pipes reaching them through the walls of the furnace. I may say here that the furnace should be so constructed as to be thrown wide open at the base immediately after serving the molds to freely admit the cold air, thereby hastening the cooling as the heat is being withdrawn.

The loss of heat by radiation from the mold chamber of the furnace should be minimized as much as possible, since this heat should be utilized to bring about quick results in the preparation of the molds to receive the molten metal. When the castings are removed from the molds they can be separated along the dividing lines E, as marked in the engraving.

A New Western Shipyard.—We are informed that the Columbia Iron Works have been organized by J. E. Rotsford, T. D. Jenks and Charles O. Duncan, all of Port

has reached its destination without accident. It will be moored at Algiers, the naval station just across the Mississippi from New Orleans. The dock will raise the heaviest battle ship. The towing of this dock is regarded as the greatest feat of the kind ever attempted in American waters. It required four powerful towing steamers.

Machinery Consolidation Completed.

At Pittsburgh last week deeds were filed by which the United Engineering & Foundry Company, organized in that city several months since, acquired title to the properties of the Frank-Kneeland Machine Company and the Lincoln Foundry Company. The property of the Frank-Kneeland Machine Company is located at Fifty-fourth street and Allegheny Valley Railway and includes 4¾ acres, on which are erected large foundries and machine shops. The price paid by the United Engineering & Foundry Company for this property is given in the deed as \$175,000. The property of the Lincoln Foundry Company is located at Sixty-first street and Allegheny

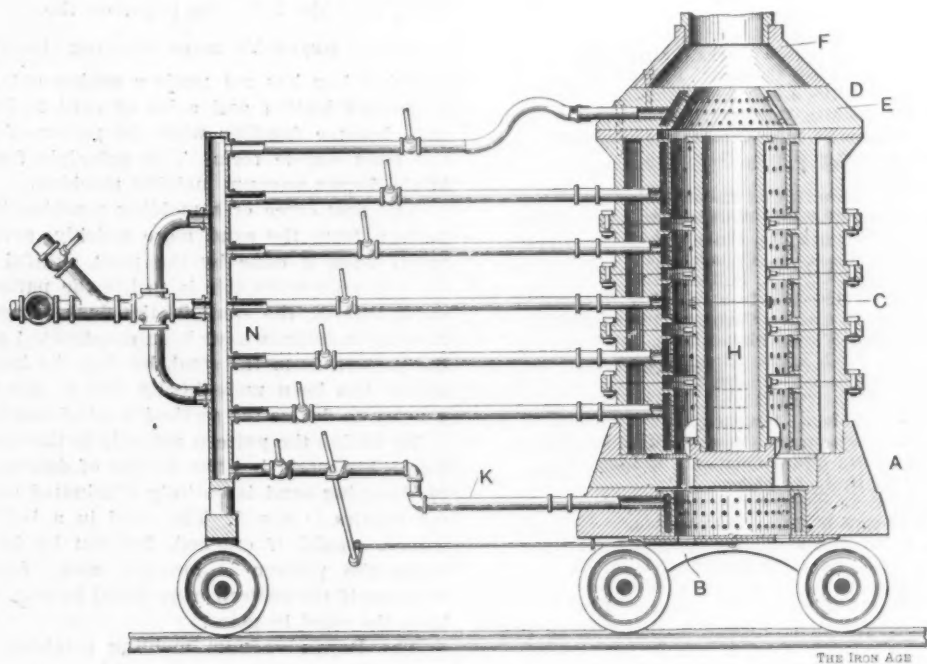


Fig. 2.—Vertical Section of Furnace.

CONTROLLING THE CONTRACTION OF METALS WHILE CASTING.

Huron, Mich., for the purpose of establishing a ship yard at St. Clair, Mich., 12 miles below Port Huron on the St. Clair River. The details of the plan have not yet been worked out, but it is stated that a large plant will be erected by the company for building steel ships. All of the incorporators are largely interested in the Port Huron-Duluth steamship line, who will require several large ships for their carrying trade, and if the present plans are carried out these boats will be the first to be put on the stocks in the new yard.

William Yagle & Co., Limited, of Pittsburgh, will hereafter manufacture the Blake ore and stone crusher formerly manufactured by the Robinson-Rea Mfg. Company of Pittsburgh. The demand for the crushers is large at the present time, a good many orders having recently been placed. The Blake crusher is well known to the trade, having been on the market for many years and is noted for its heavy construction, insuring long life and minimum of repairs. This company will also furnish parts for all machines now in use and are able to make prompt deliveries.

The floating dry dock, which was built for the Navy Department by the Maryland Steel Company, at Sparrows Point, Md., has been towed to New Orleans, and

Valley Railway and contains about 4 acres, on which are also erected foundries and machine shops. The price paid for this plant was \$160,000. These two concerns were taken over by the United Engineering & Foundry Company at the time they were organized, but the deeds to the properties have just been filed in the courts.

In addition to these two concerns the United Engineering & Foundry Company also took over the Lloyd-Booth Company of Youngstown, Ohio, and McGill & Co., whose works are at Twenty-seventh and Smallman streets, Pittsburgh. The main plant of the United Engineering & Foundry Company will be located at Fifty-fourth street, where all kinds of rolling mill machinery, including shears, tin plate and sheet mills, will be built. The plant of the Lincoln Foundry Company will remain where it is and will be devoted exclusively to the manufacture of rolls. It is probable the plant of the Lloyd-Booth Company will be materially enlarged. It will be devoted to the manufacture of rolling mill machinery and rolls, and is one of the largest and most valuable plants owned by the United Engineering & Foundry Company.

The officials of the concern are: Isaac W. Frank, president; Charles H. Booth, first vice-president; Fred. A. Campbell, second vice-president; Edward Kneeland, treasurer, and Charles A. Satler, secretary. The Board

of Directors consists of Isaac W. Frank, Otis H. Childs, Thos. J. Bray, Jr., Lloyd Booth, Edward Kneeland, Charles H. Booth, Fred. A. Campbell, J. J. Donnell, James H. Lockhart, Richard Garlick, W. L. Abbott and Charles E. Satler.

Philadelphia Foundrymen's Association.

The eighth annual meeting, also the one hundred and twelfth regular meeting, of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Broad and Walnut streets, Philadelphia, Pa., Wednesday evening, November 6, Thomas I. Rankin, president, occupying the chair. The attendance was large, there being more representative foundrymen present than has been noted for some time. Among those present may be mentioned the following:

Thos. I. Rankin, Abram Cox Stove Company, Philadelphia.
 Jas. S. Stirling, Harlan & Hollingsworth Company, Wilmington, Del.
 H. M. Baldwin, Power Specialty Company, New York, N. Y.
 Oregon J. Ward, assistant manager Howe Scale Company, Philadelphia.
 Neil Gibbons, J. Morton Poole Company, Wilmington, Del.
 D. C. Warren, the Foundry, Detroit, Mich.
 Geo. C. Davis, chemist, Philadelphia.
 Frank Schaech, D. S. Creswell, Philadelphia.
 John Fleming, S. J. Creswell Iron Works, Philadelphia.
 Thos. G. Smith, Midvale Steel Company, Philadelphia.
 Ed. J. Bergen, Bement, Miles & Co., Philadelphia.
 Ed. T. Spurr, Enterprise Mfg. Company, Philadelphia.
 August Williams, Enterprise Mfg. Company, Philadelphia.
 E. J. Decker, Paul S. Reeves & Son, Philadelphia.
 W. J. Faux, Philadelphia.
 W. E. Arnold, L. & R. Wister & Co., Philadelphia.
 Jos. Merchey, Thos. Devlin & Co., Philadelphia.
 Chas. F. Link, Thos. Devlin & Co., Philadelphia.
 H. O. Evans, Thos. Devlin & Co., Philadelphia.
 Thos. Devlin, Thos. Devlin & Co., Philadelphia.
 R. C. Oliphant, Trenton Malleable Iron Company, Trenton, N. J.
 Jas. L. Keightley, Geo. V. Cresson Company, Philadelphia.
 Fred. Stahl, Girard Iron Works, Philadelphia.
 Harry H. Stone, P. & R. R. shops, Altoona, Pa.
 Thos. Hobson, *The Iron Age*, Philadelphia.
 A. A. Miller, *The Iron Age*, Philadelphia.
 Wm. Braun, J. Braun & Sons, Philadelphia.
 J. E. Harbster, Reading Hardware Company, Reading, Pa.
 Frank Fasig, Reading Hardware Company, Reading, Pa.
 H. B. Taylor, Pettinos Bros., Bethlehem, Pa.
 Paul C. Vanfleet, I. A. Sheppard & Co., Philadelphia.
 Benj. Booze, I. A. Sheppard & Co., Philadelphia.
 I. R. Newkirk, J. B. Newkirk & Co., Philadelphia.
 Francis Farquhar, A. B. Farquhar Company, York, Pa.
 Jas. A. Taylor, Cramps' Brass Foundry, Philadelphia.
 T. B. Harkins, T. B. Harkins Foundry Company, Bristol, Pa.
 P. D. Wanner, Reading Foundry Company, Incorporated, Reading, Pa.
 J. S. Hibbs, J. W. Paxson Company, Philadelphia.
 J. K. Bougher, J. W. Paxson Company, Philadelphia.
 W. S. Messick, Pusey & Jones Company, Wilmington, Del.
 D. G. Moore, S. L. Moore & Sons Company, Elizabeth, N. J.
 J. J. McCrystal, Girard Iron Works, Philadelphia.
 F. C. Price, E. J. Etting, Philadelphia.
 Wm. Hanson, Pennsylvania Iron Works Company, Philadelphia.
 Howard Evans, J. W. Paxson Company, Philadelphia.

After the meeting was called to order the minutes of the previous meeting were dispensed with in the usual manner. The Executive Committee reported progress on the matter of incorporation of the association, and the treasurer reported a balance of \$1775.93 in the treasury, with all indebtedness paid. Mr. Moore moved that the reports be received and spread upon the minutes of the association.

The election of officers for the ensuing year was then before the association, and there being no further nominations, those who were nominated at the last meeting of the association were, on motion of Thomas Devlin, elected by the casting of the unanimous vote of the association in their favor by P. D. Wanner. The following officers were then declared elected:

President, Thomas I. Rankin, Abram Cox Stove Company, Philadelphia.
 Vice-president, James S. Stirling, Harlan & Hollingsworth Company, Wilmington, Del.
 Treasurer, Josiah Thompson, J. Thompson & Co., Philadelphia.
 Secretary, Howard Evans, J. W. Paxson Company, Philadelphia.
 EXECUTIVE COMMITTEE.
 Antonio C. Pessano, chairman, Geo. V. Cresson Company, Philadelphia.
 Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia.
 E. E. Brown, E. E. Brown & Co., Philadelphia.
 Jno. Glover, Glover Bros., Philadelphia.

William Hanson, Pennsylvania Iron Works Company, Philadelphia.

The following applications for membership in the association, which had been approved by the Executive Committee, were read:

L. R. Lemoyne, United States Cast Iron Pipe & Foundry Company, Burlington, N. J.
 Howe Scale Company, O. J. Ward, assistant manager, Philadelphia.

who, on motion of P. D. Wanner, were elected to membership.

Thomas Devlin moved that the Philadelphia Foundrymen's Association join other manufacturers and associations in sending a committee to the National Reciprocity Convention, to be held in Washington, D. C., Tuesday, November 19, which, after discussion, was amended by Mr. Wanner as follows: "That it is the sense of this association that reciprocity is the best policy of this Government for the furtherance of the interests and welfare of the country." Both amendment and motion were favorably acted upon, the chair reserving the appointment of the committee.

The papers of the evening were then presented. H. M. Baldwin of the Power Specialty Company, New York, read the following paper on the

Bryan Vacuum Molding Machine.

What boy has not made a sucker out of a scrap of moistened leather and a bit of cord to lift stones and thus become familiar with the power of a vacuum in the most simple form. This principle forms the basis of the Bryan vacuum molding machine.

The first office of a molding machine is to draw the pattern from the sand more quickly, surely and accurately than if done by the most skillful molder. The natural way to do this is to lift the pattern out of the sand, leaving the sand in the flask intact. That most molding machines have been constructed so as to lower the pattern from the sand, leaving the latter suspended above, has been undoubtedly due to the failure of ingenuity to devise the method worked out by Mr. Bryan.

By lifting the pattern not only is the operator able to watch his work, but the danger of damage to the mold by dropping sand is entirely eliminated and time taken for repairs is saved. The sand in a bolt hole, for instance, would, if cracked, fall out by its own weight when the pattern is lowered away from the mold, whereas if the pattern were lifted its own weight would keep the sand in place.

The Bryan vacuum molding machine, therefore, is primarily a machine to take hold of a pattern by means of a sucker and lift it truly out of the sand. It consists of a vertical sucker rod, supported by a frame which swings on vertical hinges over a molding bench. It may be fastened to a post or column, or to the wall.

The sucker rod glides up and down in sockets, forming part of the outer extremity of a swinging frame, and is worked through a lever having a projecting handle, which is grasped by the operator when he is ready to draw his pattern.

At the lower extremity of the sucker rod is fastened the sucker head, which is formed of a soft rubber disk held in place by an annular metal plate. An opening in the center of the sucker head communicates through the sucker rod, which is hollow, and through a flexible connection, made of rubber hose, at the top with a foot power vacuum pump which is attached to the brackets supporting the machine. In case a vacuum system exists in the foundry where the machine is located the foot pump is dispensed with and the hose at the upper end of the sucker rod is connected directly to the vacuum system. Otherwise the foot vacuum pump is worked by the operator, who, with a slight effort and without moving from his position, gives one downward stroke of the pump with his foot just as he brings the sucker head into service by lowering it into contact with the pattern or board on which the pattern is mounted.

To secure a large flat surface for the sucker head to readily grasp the pattern is usually split and mounted on a board or wooden plate, which plate is provided with bushed holes or pins to fit dowel pins or holes on

the flask in order to insure the proper matching of the two parts of the mold.

In operating this machine the pattern board is first laid flat on the molding table with the pattern up. A flask is then laid over this, allowing the dowel pins to enter the holes in the board. The flask is then filled with sand in the usual manner and rammed by hand or with a squeezer, the top flushed off and a bottom board laid on. The flask and two boards are then turned over by hand and allowed to rest on the molding table, with the pattern board on top. The pattern is then jarred to loosen it by striking the board to which it is attached with a mallet, and the operator grasps the handle on the lever and draws down the sucker rod until the sucker head comes in contact with the pattern board. In descending a valve or cock on the sucker rod strikes a tappet and opens communication between the sucker head and the vacuum pump. The sucker grasps the board carrying the pattern and the operator throws the lever up, and thus, assisted by an affixed counterweight, the sucker head draws the pattern quickly and truly into midair. At the proper distance from the mold the cock on the sucker rod is again thrown by a tappet, thereby disconnecting the sucker head from the vacuum and opening communication between the sucker head and the atmosphere, thus releasing the pattern and board, which fall readily into the hands of the operator, who has in the meantime let go of the handle by which he raised the sucker rod.

A small dash pot attached to the frame and the lever keeps the sucker rod from flying up too quickly. The flask containing this portion of the mold is then placed on the floor and is ready to receive the other part, which is prepared in a like manner.

More than one operator can use the same machine, as the length of time required for drawing the pattern is considerably less than that required for filling the flask. The machine is easily swung to and fro, so as to be used by each man as he is ready to draw.

A pneumatic rapper is often attached to the sucker head, receiving its supply of air through a small flexible connection, and fitted with a cock, also controlled by tappets, so as to put the rapper in operation automatically only while the pattern is being extracted from the sand.

It will be seen that the machine is extremely simple in construction and operation. A few hours' practice will enable a green hand to make a perfect mold, and rapidity of operation follows very soon.

The preparation of the pattern for the machine requires very little expense, as almost any form of wooden pattern may be used by merely mounting it on the match board. Once attached to boards in the pattern shop the change may be made on the machine from one pattern to another as often as desired and without loss of time, which advantage is very great when but a few castings are required from any one pattern. As many flasks can be made from any number of patterns in the same time that the same number of flasks can be made from one pattern.

The saving in the doing away with the stripping plates also gives the machine a decided advantage over other forms, and opens up opportunities for machine molding which would otherwise be lost.

The use is not confined to any particular size of flask, but may be described as general for any style of bench work.

By mounting the two parts of a split pattern side by side on the same board two castings from but one pattern may be made with one operation, as the impression made by one half in the cope covers over the impression made by the other half in the drag, while, to carry this same idea still further, one half of a symmetrical pattern may be used with equal facility to form a complete mold.

In addition to green sand molding this machine finds a useful field in core work by using it to lift the boxes from complicated cores.

The machines are made in two styles, one of which may be set up in any foundry by attaching it to a post or column, or even a wall; the other is self contained.

They are furnished with or without the foot vacuum pump or pneumatic rapper, and all the special features are fully covered by letters patent.

Although they have been on the market but a short time, the interest which they have already created, as proved by the activity for trial orders, encourages the builders to believe that they are destined to satisfy a long felt want.

Mr. Baldwin made a practical demonstration of the operation of the machine, which was mounted in the room and various green sand molds made. Some discussion followed, after which a paper on "Controlling Contractions of Metal While Casting," by Wm. D. Allen, Huntsville, Ala., was presented and read by H. O. Evans. Mr. Moore then moved that a vote of thanks be tendered for the able papers presented, which was passed, and the meeting adjourned, after which those present proceeded to the roof garden of the club, where luncheon was served. Howard Evans, acting as toastmaster, called upon Thomas I. Rankin, Francis Farquhar, P. D. Wanner and Thomas Devlin, each of whom responded in an entertaining manner, after which the social session adjourned.

The Reciprocity Convention.

WASHINGTON, D. C., November 12, 1901.—The advance guard of the delegates to the reciprocity convention to be held in Washington beginning November 19 has already arrived here, and arrangements for the conference are being rapidly perfected. A very large attendance is already guaranteed both of delegates and of others interested in the proceedings of the conference, which promises to be the most notable gathering of business men ever held in the national capital.

While no effort has been made to prepare a cut and dried programme to be urged upon the convention, yet certain important plans have been perfected, and the lines which the deliberations of the conference will follow are tolerably well marked. Perhaps the most significant feature of the outlook is the probability that the conference will decide that the pending treaties, and especially the French convention, cannot be ratified in their present form. The opposition of representatives of the knit goods, silk, jewelry, and California fruit growers is so strong in Congress that the French and West Indian treaties are looked upon as doomed to failure, at least in their present form.

Two alternative propositions are receiving attention here, either of which would involve the abandonment of the pending treaties, and the negotiation of others in their stead. The first provides for the appointment of a commission charged with the duty of gathering information for the guidance of the State Department in the negotiation of reciprocity treaties. The second proposition is one that was described in these dispatches several weeks ago as having been under consideration by President McKinley some months before his death. This involves the repeal of the reciprocity provisions, Sections 3 and 4, of the Dingley act, and the substitution of a maximum and minimum tariff, similar to the French system. It is proposed that the Dingley rates be taken as the maximum and that Congress determine just how much reduction, if any, may be made by reciprocity treaty on each item.

Any attempt to agitate the tariff question, aside from its direct bearing upon the subject of reciprocity, will be very generally deprecated by the delegates to the coming conference. It is maintained that all the problems now confronting the commercial community with reference to foreign markets, &c., can be met in a thoroughly satisfactory manner by the adoption of a practicable scheme of reciprocity, and it is urged that unless the present tariff rates are treated as permanent it would be impossible to formulate any practicable reciprocity plan.

W. L. C.

Charles Dorf Mix has moved his office to 192 Purchase street, Boston, Mass., where, having opened a steel warehouse, he will carry a full line of best cast steel as well as extra and special brands, all of which is made by the John Illingworth Steel Company.

The Iron Age

New York, Thursday, November 14, 1901.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

The Car Famine.

That the iron industry is not the only one suffering from an inadequate railroad equipment to meet the exigencies of the hour is evident from the trade reports with which the press is teeming. From the West, from the South, from the East, come reports of delayed shipments of raw material and embarrassment, more or less pronounced, resulting from the congestion of freight in various parts of the country.

No better illustration of the sympathetic relation existing between various industries could be offered than the present picture of the business situation. It is only when the smooth working of the economic machine is interrupted that the intimacy of the component parts is fully realized.

In some quarters there has been a disposition to hold the transportation companies entirely responsible for the lack of an ample supply of rolling stock to move all freight offered expeditiously. That this is manifestly unjust only a clear insight into conditions existing and a calm consideration of the facts are necessary to prove.

Every business man, every manufacturer, knows that there are tides of ebb and flow in industrial channels; periods when the trade winds blow west, then east; seasons of feast and seasons of famine in order. At this very time the rail mills are a conspicuous example of orders booked beyond the capacity to fill and of a necessity business placed for delivery in 1901 must be extended into 1902. If the mills could be assured of sufficient demand to take up rollings steadily on the basis of present business they would immediately take steps to increase capacity as a plain business proposition, but time, greater or shorter, must enter into the calculations.

So it is with the railroads. There are times during the year when the tonnage offered calls for the employment of every available car and locomotive with which the transportation companies are equipped; rolling stock which has been discarded even is sometimes pressed into service during the emergency. Then comes the waning period, and later, not a few idle cars are on sidings, housed or in repair shops. To provide terminal facilities and equipment ample to move promptly all freight offered during the rush time, especially during an abnormal period of activity like the present, would mean an accumulation of idle cars and locomotives eating profits, if not gathering losses for the management to face, during the dull seasons.

Of course, all well managed railroads should and do provide new and improved equipment to cover the natural increase in business from year to year, as well as to cover the steady wear and tear and loss through fire and accident of rolling stock. And this is one potent reason why prominent railroad managers are such close students of commercial, financial and industrial affairs, and why they are able to command such large salaries, as by their foresight they are often able to meet an emergency or avert a catastrophe, saving to the company many times the amount of their stipends, which

seem relatively so large. And the same remarks, modified to meet the conditions, might be applied to the management of large industrial plants, especially those in the realm of iron and steel.

But it would require superhuman knowledge to forecast and provide against all emergencies which may arise during the prevalence of abnormal conditions; and the present is one of those times.

There are always periods of freight congestion during each year, more or less severe, and it is the duty of transportation managements to prevent them within all reasonable limits, or to relieve them as speedily as possible when they do occur. Car famines have occurred before and probably will occur again, but there can be no doubt that the important railroads are doing all possible now to move the tonnage offered and grant immunity from the consequence of the congestion now suffered.

In some respects the inconvenience, annoyances and even losses now endured by the iron and steel industry, in the Pittsburgh district especially, are due to the enforced idleness of plants resulting from the long-to-be-remembered strike of the iron and steel workers. As there was abnormal depression then, there is abnormal activity now, and in equal amount, as "action and inaction are equal and opposite."

From the strike, the transportation companies suffered as well as the mills and furnaces, and if some of the surplus cars made idle by the closing down of industrial plants were diverted to other points, there to be made to earn interest on invested capital, it would only be regarded as a wise business move. But once these cars were engaged elsewhere they could not be readily released; then, too, proper economic consideration would demand that the cars be returned loaded. There is no profit in hauling empty cars over the country.

This year, and at this time, the railroads are called upon to transport not only cotton in the South and grain in the West, held back for more favorable markets in the light of the crop marketing season, but are simultaneously offered a heavier tonnage of general merchandise than for many years. All this comes, too, at a period when industrial plants are making a strenuous effort to secure a larger supply of fuel and raw material to provide against delays and drawbacks incidental to the winter season. This occurs ordinarily at this time, but this year, with the stimulus referred to, the meltings of mills and foundries have been unusually heavy and furnaces have been blowing to the limit of capacity, and they have made extraordinary demands upon the railroads. That the latter should be compelled to bank in the midst of the rush is to be regretted and of course is by all either directly or indirectly interested. However, "what can't be cured must be endured," and fortitude can be afforded, as the cure will come at no very distant day. Patience, too, can the more readily be exercised when it is realized that the present conditions are not due to the perverseness of the railroads.

The *Iron and Steel Trades Journal* (London) remarks editorially that the raising of the tariff wall around the new Commonwealth of Australia, so that the mother country is made to stand on an equal footing with foreign nations, is another reminder that Great Britain cannot go on indefinitely acting on the free trade principle. Britain's South African possessions may be expected to follow the example set by Canada and Australia. "After all," says the editor, "our position, in the United Kingdom, is very much like that of a wealthy parent devoted to his children. What he gives and does for

them is with his whole heart and good will for their future welfare. But even if he should never expect all or anything back of what he has given, while they seek and expect his protection, his support and backing, he may at least look for some consideration in return for such services. At this time," he continues, "our 'cute' and far-seeing American cousins are proclaiming that reciprocity is the watchword to mere outsiders, if their manufacturing industries are to find the necessary outlet." The whole situation is summed up in the utterance of Sir Wilfrid Laurier, the Premier of Canada, when he said that the solution of the question of practical unity within the Empire was the establishment of an Imperial Zollverein.

Steel Frames in Buildings.

The question of the durability of the steel frames which are the skeletons of most of the modern office buildings now under construction or of comparatively recent date has given rise to much discussion. Of the contributions to this discussion which have appeared in the technical press, it may be said as of the virgins of the parable, that some are wise and some foolish. The optimists have waved the whole subject aside and contented themselves with the assertion that steel skeleton frames would last a thousand years, if necessary, and that when the buildings into which they enter are pulled down—as they ultimately must be, since the fashion of this world passeth away—every pound of material would be found intact and as good as the day it was made. The pessimists, on the other hand, have shaken their heads and speculated as to rust and electrolysis and brittleness induced by vibration, and have amused themselves and those who listened to them by oracular prophecies that some day it would be found that hundreds of thousands of millions, more or less, have been invested in superstructures, resting upon nothing more substantial than rust piles and mortgages. We are not sure that there has not been some speculation as to whether there is not some sort of cimex, or microbe, capable of acquiring an appetite for architectural steel, which will so far adapt itself to its new environment as to take a hand, so to speak, in punching skeleton frames full of holes. Between these confident extremists have stood the great mass of conservative and practical people, who have admitted that steel skeleton frames were an experiment, but that steel was the best material for frames yet found, and that its use in architecture represents the present "state of the art"—which is equivalent to saying that we are using the best material we have in the best way we know. What experience may teach us we shall know when we have learned it; meanwhile, it is not necessary to lose sleep speculating as to whether steel frames will last only as long as the buildings they are in, or a good deal longer.

However, the question is one of both technical and practical interest, and any facts of value bearing upon it merit attention. The subject of rust protection was discussed in some detail in a lecture lately delivered before the School of Architecture in the University of Pennsylvania, by William Copeland Furber, C.E., which he has digested for *Insurance Engineering*. That his views are of the kind well calculated to challenge attention and provoke controversy may be judged from the following sentence, which serves by way of introduction: "The present architectural design of buildings in which an iron frame is used for supporting the masonry is the cheapest form of dissimulation, and we can imagine the disgust with which our successors in years to come will

regard the work of the present generation." We imagine that Mr. Furber's indignation is aroused less by the steel frame, which serves an extremely useful purpose and represents the best possible constructive use of the material, than by the shams and pretenses of a style of architecture applicable to *façades* in which the console, dentil, pediment, column, &c., all of which once meant something and had a function, are used as incidents in a scheme of decoration, which violates all the canons of art. But art is long, as has been sententiously remarked in familiar verse, and whether the architecture of the steel frame building of to-day is a hollow sham or not may be left to those who forget that they wear vests with cloth fronts and muslin backs, and that the buttons on the skirts and sleeves of their coats are mere survivals of long discarded utilities in masculine raiment. The question of deterioration from rust is of vastly more practical importance, and this should be considered as carefully as the facts available permit. The covering of steel members leaves us dependent very largely upon theoretical deductions, and as comparatively few steel frame structures have been pulled down we really know very little about the condition of frames put into use at any time within the past ten years or so.

As Mr. Furber points out, the rusting of iron or its variants depends upon the co-ordinate action of three agents: water, an acid and oxygen. If we can break up this combination in any way we have stopped rusting effectually. To keep water in all forms away from iron is difficult, so long as it is in the ground and works up through walls by capillary attraction. Oxygen will go wherever air can penetrate, and will usually carry more or less water with it, or find it there. The water is reasonably certain to be more or less acidulated, and we thus have the trinity of destructive agents, like the poor, with us always. But by neutralizing the acid the combination is broken and rusting cannot take place. Chemically this line of reasoning is all right, but its usefulness in the case under consideration depends upon its application. Mr. Furber is of the opinion that rust proofing a structure is really a very simple matter, since we have a material available for use in connection with steel frames which possesses the property of rendering harmless for purposes of deterioration any water which may reach them. This is Portland cement, which, being a product of lime, furnishes an admirable base for any acid which may work its way to the steel, and so renders rusting impossible. To secure the best results the metal should be clean and the concrete of Portland cement and sand in intimate contact with it. The cleanliness required consists in freedom from mill scale and incipient rust, and from paint. Mr. Furber is of the opinion that "in time to come specifications will require that all metal work shall have the surfaces cleaned with the sand blast, so that the covering can be applied directly to the metal and not to the scale or skin, which usually covers it when it is received from the rolling mills." On this point we think he is mistaken, but that is unimportant. His practical directions will have interest for engineers doing this class of work:

After the surface of the metal work is clean, it is best, if possible, to cover its surface with a simple mixture of Portland cement and sand, but as this is not always practicable, a close contact can be assured by using a concrete made with a liberal proportion of mortar and the aggregate or filler in small pieces, ranging in size from particles as large as a pea to those which will just pass through a $\frac{3}{4}$ -inch ring. If the material forming the aggregate is larger than this it is apt to bridge over voids and prevent the ramming of the concrete into a solid, homogeneous mass. The rate of expansion from heat being practically the same in iron and cement, if the contact is properly made between them they will act together thereafter, so that success in this rust protection demands that the work be done right in the first place.

These directions would seem to apply to steel members in the foundation courses. For the protection of external columns and girders which are liable to be reached by moisture and air which will work through stone and brick walls, he recommends protecting envelopes of Portland cement concrete, which is best secured in place by a fabric of wire netting of small mesh, with juxtaposed edges bound together. The concrete material is then molded in temporary boxes, which are removed when the setting is completed.

This method of treatment is simple and relatively inexpensive, and has much to commend it to favorable consideration in all kinds of structures which have any claim to be classed as monumental architecture. It has the further advantage of imparting to steel members to which it is applied a high degree of fire resisting power. It requires employment in a very different way from that recommended for rust prevention if absolute fire proofing is sought, which it seldom is. Experience has shown that such a thing as a fire proof building, if possible, would be uncomfortable and undesirable for occupation, and that what the underwriters recognize as "slow burning construction" is practically better.

Those for whom this subject has immediate interest, and especially those connected with the erection and preservation of structures in which it is impracticable to apply protecting envelopes of concrete, will find the literature of preservative coatings for iron and steel surfaces best summarized in the admirable paper of M. P. Wood, in Vol. XXII, "Transactions American Society of Mechanical Engineers." It is much too large a subject for general editorial discussion.

A Sharp Arraignment.

Nearly half a century ago the prophetic soul of Lord Macaulay was moved to utter a warning that unless the tricks and manners of the British people changed for the better, a New Zealander would stand upon London Bridge some day and view the ruins of St. Paul. Since that time divers others have lifted up their voices in remonstrance against the apathy with which the average Briton views the advances of other nations, and have urged him to enter the lists in the race for supremacy, but to no purpose, for, like Esau, he is joined to his idols and laughs alike at the New Zealander and all of his kin.

The latest of those crying in the wilderness is Lord Rosebery, who in a recent address to the students of the Birmingham and Midland Institute said that the self complacency of his countrymen would lead to their undoing, that if they did not go forward they would go backward, and many other wholesome truths, which, if heeded, would delay the arrival of the New Zealander for another half century, and, perhaps, so discourage him that he would abandon his journey altogether. A portion of Lord Rosebery's very interesting remarks is given herewith:

Note the restless enterprise of the United States, with the devouring anxiety to improve existing machinery and existing methods, and the apparent impossibility of accumulating any fortune, however gigantic, which shall satisfy or be sufficient to allow of leisure and repose.

There the disdain of finality, the anxiety for improving on the best, seems almost a disease; but in Great Britain we can afford to catch the complaint and give in exchange some of our own self-complacency, for complacency is a fatal gift. "What was good enough for my father is good enough for me" is a treasured English axiom which, if strictly carried out, would have kept us to wooden plows and water clocks. In these days we need to be inoculated with some of the nervous energy of the Americans.

Occasionally the British nation wakes up and finds that its methods or machinery are out of date and even decayed. It de-

mands, for example, that some department or other should be placed on a business footing and brought up to date, and having made the demand it turns its attention to something else, or goes to slumber; then it wakes up again, finds that nothing has been done, grumbles, and perhaps swears, and turns its attention to something else or perhaps slumbers again.

It is curious to note that an American artist who has recently returned to this country after a sojourn in England of ten years says that he has become so accustomed to the slow, methodical ways of living there that when he arrived here the first thing that struck him after his absence was the tremendous nervous force expended by every one in transacting business, and in a few days he found himself rushing headlong, hither and yon, as eagerly as any one. In view of this fact, for such it seems to be from the testimony of others also, it is not impossible that our English cousins have been maligned, perhaps nagged is the better word, and held morally responsible for conduct which was wholly the result of climatic conditions. Certainly it is not reasonable, or accountable, that any nation should either willfully or obstinately shut its eyes to the evidence of its ledgers, which prove that they are doing a losing business, when by adopting different methods they could prosper. It is very difficult for any race to change its habits, or its buying and selling, after centuries of custom. There is one law and no other known to it, and that one is followed.

Why should the world at large, or at all events this portion of it, single out England for a terrible example, when there are the Latin peoples who are much worse?

In Italy and in Spain, and especially in portions of South America, there is no such thing as business in the American acceptance of the term, the utmost laxity prevailing in every transaction of life, yet these nations are suffered to follow their own ways without adverse criticism. England alone, by reason of her history possibly, and her exalted commercial standing, is scolded and condemned for adhering to "creeds outworn." It is not impossible that England's own attitude in the Congress of Nations is responsible for much of this. It is a national characteristic for her to loudly praise her own wares in the market and as loudly disparage those of other countries. Reprisals naturally followed, for nations are only concrete expressions of their leading men. It is to be expected that generally aggressive, domineering policies should meet with public disapproval in commerce as in social circles, and stumbling blocks will be laid in the way of countries who demand that others must pay tribute to them by divine right.

Neither Lord Rosebery nor any other son of England's soil will effect reforms or changes by telling his countrymen the consequences of their course. Such as it is it always will be, until, possibly, the shadow of the New Zealander falls athwart the dome of St. Paul's. It will be too late then to "overturn and overturn until not one stone is left upon another."

The October fire loss of the United States and Canada, as compiled by the New York *Journal of Commerce*, amounted to \$14,749,000. This is nearly double the aggregate losses of September and more than double the record charged against October of last year. The fire insurance companies in general are said to have lost a great deal of money this year and an advance in rates is likely to be made. The country's total fire loss for the ten months ending October 31 has reached the sum of \$135,404,000, an average of over \$13,000,000 a month.

Henry C. Frick of Pittsburgh has presented to Fayette County, Pa., a fine portrait of General Lafayette, after whom the county was named. Mr. Frick bought the painting in Paris last summer.

CORRESPONDENCE.

Prospects in India.

PROVIDENCE, R. I., November 6, 1901.

To the Editor: In your issue of October 31 I notice a small article on "Prospects in India," by "S. G. H." My 20 years' experience in the East Indies as an engineer, for 13 of which I was engaged with the leading engineering firm in Calcutta, places me in a position as an expert to give very material information on this subject. Any one having a real interest in the expansion of trade in all its various branches in such a large and lucrative market must needs first learn how to deal with it.

It is a well-known fact that business operations differ in all parts of the globe. To send men to the East green to the method is a waste of energy and likely to turn out unremunerative. I notice "S. G. H.'s" remark about Germany sending men out to the East. I was there when Germany commenced operations about ten years ago in but a very small way. Now they run some of the largest steamers direct, with all classes of goods, competing favorably with the British, both as importers and exporters. It certainly only requires a small amount of energy on the part of the United States to secure a fair amount of business and enable Americans to keep a fleet of boats in continual operation between fixed ports on this side and Bombay, Colombo, Madras and Calcutta on the other.

When in the East I occasionally purchased pumps and plows from the United States. But what did this really mean? Why, it was like sending an order to the next world, not having any direct communication. As an illustration. The order by mail takes, say, one month; dispatching goods to New York, three weeks; shipping to Glasgow for transshipment, two weeks; shipping from Glasgow to Calcutta, six weeks; in all, say, three months, but would usually extend to four months. Then payments mean documents through London for collection. Now with direct communications and fixed agencies in the East all this delay would be materially obviated.

You would have a market in which every manufacturer in the United States could very largely participate, and the annual statistics for which you would find I imagine in any of the leading libraries in New York. There is no doubt but the present time is greatly in favor of a very largely increased demand for railway material, heavy and light hardware, textile goods, small wares, jewelry, fancy goods and canned provisions. Proper arrangements for opening up this trade would not only require capital but quick, intelligent men of business connected with the various branches and must be conducted on a high class level with no skimping to be a credit worthy such an undertaking.

J. J. W.

The Philippines Transportation & Construction Company.

The four steam canal boats and 15 consorts which have been plying between New York and Cleveland via the Erie Canal and Lake Erie, are to be cut up and shipped to Hong Kong. There they will be put together and proceed to Manila to do a general lighterage and interisland business. These boats have been purchased by the Philippines Transportation & Construction Company, a new corporation just organized under the laws of New Jersey. The work of cutting them up is being done at the Morgan Iron Works, New York.

The president of the Philippines Transportation & Construction Company is H. F. Lyman of Cleveland, Ohio, representing a large cordage purchasing plant. The first vice-president is S. H. Chisholm, president of the American Grass Twine Company and vice-president of the American Steel & Wire Company. The second vice-president is General E. C. O'Brien, president of the International Dispatch Company; general manager, Chas. E. Wheeler, Cleveland; home manager, Ira Taylor, New York.

At the present time lighterage facilities in the Philippines are exceedingly primitive. The Government has

been particularly hampered by the absence of facilities. The new company are making arrangements for handling the hemp business, and have, it is claimed, secured exclusive rights for machinery to modernize existing practices in the Philippines. The company also propose to go into other than lighterage business.

Improvements at Crucible Steel Plants.—Work is progressing rapidly on the new blast furnaces being built by the St. Clair Furnace Company, and also on the open hearth steel plant being erected by the St. Clair Steel Company, at Clairton, Pa., 20 miles from Pittsburgh, on the Monongahela River, both of the above being subsidiary interests of the Crucible Steel Company of America. Three blast furnaces are being built, and the foundations for these are all in and the columns are up. The iron work is being pushed as fast as possible, and is being done by the Riter-Conley Mfg. Company of Pittsburgh. The steel building to contain the open hearth furnaces is 900 feet long, and is about half up. The blooming mill engine is being placed, and is being built by Mackintosh, Hemphill & Co. of Pittsburgh. A water works is well under way. An office building is being constructed, and the St. Clair Steel Company expect to be making steel in the early summer of 1902. One blast furnace will likely be ready for operation a short time after the steel works get started. The entire output of steel of this plant will be used by the constituent companies of the Crucible Steel Company of America.

Railway, Steamship, Machinist, Factory and Electrical Supplies.—Manning, Maxwell & Moore, 85 Liberty street, New York, have issued a quarto volume of 1000 pages describing the complete line of railway, steamship, machinists' and contractors' tools and supplies built and handled by them. We can best illustrate the scope of the volume by mentioning the fact that the index alone embraces 38 pages of three columns each. The first portion deals with machinists' tools, taps, dies, reamers and measuring instruments, chucks and the like, followed by bolts and nuts of every variety, and appliances for conveying apparatus. Pipe fittings, valves, water gauges, safety valves and steam pipes occupy the next section. Then appear boiler feed pumps, sinking pumps, injectors and pressure and vacuum gauges. Considerable space is devoted to various types of lubricators, boilers and similar appliances. The catalogue covers almost every conceivable appliance used by machinist or contractor, and those interested in any way in the shaping or handling of materials.

Franklin Steel Casting Company Addition.—The foundations for the new addition to the plant of the Franklin Steel Casting Company, Franklin, Pa., have been finished and work on the new building will be pushed as fast as possible, in order that it will be ready for operation early in the new year. The Fort Pitt Bridge Company of Pittsburgh have the contract for the structural work. A gas producer and a 15-ton open hearth furnace will be built. When these additions have been finished the capacity of the Franklin Steel Casting Company for the manufacture of steel castings will have been increased more than 50 per cent.

The Rolling Mill Company of America.—Nearly all the contracts for the new plant of the Rolling Mill Company of America to be erected at South Connellsville, Pa., have been placed and excavating for the new building has been started. The initial plant will consist of six sheet mills, but the buildings will be laid out with a view of making it a 20-mill plant in the future.

Another Sheet Mill at Pittsburgh.—Hubbard & Co. of Pittsburgh, manufacturers of shovels, railroad and mining tools, are erecting a two-mill sheet plant near their present works in that city. The company will buy their sheet bars in the open market, but may possibly put in a bar mill later on. This concern are installing some new machinery in their railroad tool department.

Locomotives, Pig Iron, Gas Making and Shipbuilding in Scotland.

GLASGOW, October 31, 1901.—American readers will doubtless have marked with interest the controversy which has been created by a letter from the Secretary of State for India (Lord George Hamilton) on the subject of the supply of locomotives for the Indian railways. Although Lord George's letter had special reference to a contract recently given to a German firm, the real point at issue is one of Anglo-American competition. The contract given to the Germans was given at a price which neither British nor American producers would have accepted at the time, being well filled with orders at payable rates, and it would probably have been taken by the Germans at even a lower price had they been pressed, because they were more bent on keeping their works open than on making profit. This is not the kind of competition that disturbs an established business. It is an annoyance, but it lacks the conditions of permanence—just like the exporting just now of pig iron from Germany to Britain—the real question at issue is whether or not the Indian Government can obtain cheaper and quicker supplies of locomotives in America than in this country. As to price, our producers affirm that no one could beat them if standardization were practiced in this country as in America, but the practices and prejudices of our railway companies at present prevent standardization. The Secretary for India, however, has summoned a conference of Indian railway engineers and managers to consider whether standard types cannot be adopted for all the Indian railways. As to speed of delivery, our Scotch producers have over and over again warned the Indian Government that they were keeping their orders back too long, and that they should order in advance, not when trade is at full pressure, but when work is slack and prices are low, which happens about every two or three years or so.

Now this is a question of special and peculiar interest to this part of the United Kingdom, for Glasgow is the "hub" of the locomotive industry, and it was from Glasgow that the warnings emanated which the Indian Government ignored, and for ignoring which they have found themselves in a tight corner. Our locomotive builders admit the excellence of the American engine shops, but they do not admit the superiority of them to their own in point of equipment. But of course they are compelled to work on somewhat different lines, for the reasons above stated. Leaving, however, the controversial aspect just now, I will give a few details about the Scotch industry.

The leading railway companies of England and Scotland build locomotives for themselves, but cannot always turn out all they require, and therefore are frequent purchasers from the locomotive builders. Putting aside the railway shops, there are in Great Britain ten concerns, employing some 15,000 men, engaged in the constant production of railway engines and nothing else. Three Glasgow firms employ more than half the men, and produce more than half the output. The leading firm in the industry is Neilson, Reid & Co. of the Hyde Park Locomotive Works, Glasgow, a concern who date back to 1837, and who are now the largest one of their kind in Europe. These works now turn out one engine per day of the varied types demanded of them. Working on the American system and American standard types the plant is capable of turning out from two to three locomotives per day. I do not know that any existing works in America can do much more. I do not know if any works in America could turn out even one locomotive per day if the types in every contract varied, as they do in the case of the contracts our builders have to handle.

The next largest concern are Dubs & Co., Glasgow, founded some 40 years ago by a former manager of the Hyde Park Works. This firm, who build largely for the colonies and India and South America, as well as for home railways, turn out seven locomotives per fortnight of 11 working days, which is about one engine every day and a half.

The third largest concern are Sharp. Stewart

& Co., Atlas Locomotive Works, who transferred their operations from Manchester to Glasgow some 12 years ago on amalgamation with the Clyde Locomotive Company. This firm are large producers of machine tools, but the locomotive department is distinct and employing some 1600 men turns out 150 engines per annum. That is rather more than one locomotive every two working days. In every case the output could be doubled if not trebled by the standardization of types, and in each case extensions are constantly in progress and can be indefinitely prolonged. The Caledonia Railway Company, the North British Railway Company, and the Glasgow & Southwestern Railway Company have each engine shops at Glasgow for their own purposes, not for sale, and each of them can turn out at least one new locomotive per week, besides repair work, and Andrew Barclay Sons & Co., Limited, whose works are at Kilmarnock, turn out large numbers of colliery and contractors' locomotives, of which they make a specialty.

It will be seen that Glasgow takes the lead in the locomotive industry of the United Kingdom, as well as in the shipbuilding industry. Both industries have been highly prosperous for the past two years or so, and it has had much to do with the prosperity of our iron and steel trades. Both industries, too, were well represented at our international exhibition, which will have closed its doors before these lines are in print. Contrary to what we hear of the Buffalo Exposition, this has been an unqualified success from beginning to end. It has been visited by 10,500,000 people, and the record will reach 11,000,000 before the gates are finally closed. And it will leave a surplus which at present is estimated at £100,000 (\$500,000), and which may be more. Such a handsome profit is not a common experience in international exhibitions, and it may be taken as a signal mark of the intrinsic merit of the Glasgow show, and of the energy, enterprise and good judgment of the management. The surplus, whatever it is finally ascertained to be, will be handed over to the corporation of Glasgow for purposes connected with science and art within the municipality.

The close of the exhibition, however, I fear marks the beginning of a time of depression in business. The steam is out of shipbuilding, coal is coming down and weakness is appearing in the iron and steel trades. A spurt in pig iron warrants last week was not due to any excess of demand, but to the cornering of sellers for the fall. What warrants are in circulation just now are mostly held by a few hands who work the market to suit themselves. There is little real life in speculation in it, but there is still an oversold account, especially for Cleveland warrants, which explains why Cleveland iron is still being sent into store at Middlesbrough. The natural tendency of pig iron now is downward, with declining exports, discouraging prospects in finished iron and steel, and increasing imports from Canada and Germany. Whether the latter are profitable or unprofitable for the producers, they serve to depress the market. Our smelters are kept busy enough in supplying current contracts, but they are not finding home consumers very eager to buy ahead, and they are not getting coal so cheap as it ought to be just now. To counteract the effect which the miners hope to create by multiplying their weekly holidays, the ironmasters may be compelled to blow out a number of furnaces. The iron trade is the largest consumer of coal in this country.

Probably the consumption for gas making is the next largest item. In this connection the gas engineer of the corporation of Glasgow, William Foulis, has just laid some interesting information before the Institution of Engineers and Shipbuilders, of which he has been elected president. Few of us, perhaps, remember, if we ever knew, that it is just 100 years since coal gas was introduced as an illuminant. The inventor was William Murdock, a young Scotch millwright, who erected the first gas illuminating plant in the works of James Watt, the Scotch inventor of the steam engine. Thus were two great epoch makers thrown together. Murdock was a mechanical genius, and it is only now being recalled that the inventor of gas lighting invented a steam motor car before the locomotive was thought of, as also the D slide valve and the oscillating steam cylinder. It is just 100

years since he erected the first gas plant in the works of Boulton & Watt, but it was some years after that date before the illuminant was generally adopted for street lighting.

Curiously enough, the production of coal gas is now enormously larger than it ever was, notwithstanding the extensive use of electricity, kerosene and other illuminants. The occurrence in the Glasgow Exhibition—one of the features of which in the Machinery Hall was the large display of gas engines—recalls the fact that it is just 23 years since the Otto gas engine was first publicly shown—viz., at the Paris Exhibition of 1878. Ten years later, so rapidly did this means of power production develop, there were 50,000 Otto gas engines at work. It is estimated that at present the production of gas engines in the United Kingdom is from 6000 to 7000 per annum. The efficiency has developed enormously. Twenty years ago few gas engines used less than 30 cubic feet of gas per brake horse-power, and obtained a thermal efficiency of 12 per cent. To-day the consumption may be taken at 13 cubic feet per indicated horse-power and 15 cubic feet per brake horse-power, and the thermal efficiency at 25 per cent. These are figures of Mr. Foulis, who says that in recent tests consumptions as low as 13.4 cubic feet per brake horse-power have been obtained, with a heat efficiency of 29 per cent. The future use of gas as the motive power depends on the saving which may be effected in the proportion of heat generated—about 40 per cent.—which is carried off in the exhaust gases. However that may be, it is evident that electricity has by no means extinguished coal gas.

The end of the ten months of the year finds Scotland with a record of 443,535 tons of new shipping put into the water—the largest ten months' output on record. The output in October has been 48,000 tons, but the new contracts booked during the month do not exceed 25,000 tons. These figures tell their own story.

PERSONAL.

Charles H. Memory of Pittston, Pa., has resigned the auditorship of the Temple Iron Company, in order to take the management of the new Webster Coal Company, at Cresson, Pa. He is succeeded by George L. Houser, who will make his headquarters in Scranton.

D. C. Lloyd of the James Bridge Steel Works of Wednesbury, England, is visiting the principal iron and steel works of the United States.

C. B. Sill has resigned his position as manager of the United Boiler Company, at Girard, Ohio.

Eugene W. Pargny, general manager of American Sheet Steel Company, with headquarters in Vandergrift Building, Pittsburgh, sailed for Europe on Wednesday, November 13, on the "Oceanic." Mr. Pargny has been an exceedingly busy man for a long time, especially during the summer months, and goes abroad for the purpose of seeking a much needed and well earned rest.

Samuel Thomas, of Catasauqua, Pa., has presented to St. Luke's Hospital, at South Bethlehem, Pa., a splendidly equipped operating pavilion in memory of his wife.

Max Daunert has returned from his European trip to resume his duties as manager of the New York office of Schuchardt & Schütte.

R. H. Pritchard has resigned the superintendency of the Bessemer Rolling Mill, Bessemer, Ala., to take effect December 1.

Andrew Carnegie has advised the Board of Trustees of the Carnegie Institute of Pittsburgh of his decision to increase by \$2,000,000 his already large gifts to that institution, and to the polytechnical school about to be established in Pittsburgh through his munificence.

Kirk C. Gardner of the Lloyd Booth department of the United Engineering & Foundry Company, Pittsburgh, has been placed in charge of the estimating department of that concern. Mr. Gardner will remove from Youngstown to Pittsburgh, where the head offices of the United Engineering & Foundry Company are located.

Andrew Carnegie has been elected Lord Rector of St. Andrew's University, in Scotland.

Charles M. Schwab, president of the United States Steel Corporation, will sail on January 4 for Europe, to be gone about six weeks.

Charles E. Pope of Charles E. Pope & Co., iron and steel factors of Pittsburgh, and also president of the Pope Tin Plate Company of that city, has gone to California to recuperate his health.

J. L. Rea of the Carnegie Steel Company, at Pittsburgh, will remove to New York about January 1 to enter the employ of Charles M. Schwab in a confidential capacity.

New Angle Mill at Homestead.—Plans are being drawn by the Carnegie Steel Company for the building of a large new angle mill, which will be erected adjoining the Howard Axle Works. The mill will roll all sizes of angles from 3 x 3 inch up to 8 x 8 inch, and will have a capacity of 12,000 tons a month. Work will be commenced in a short time, and it will be pushed to completion as fast as possible. Work is proceeding on the enlargement of the armor plate department at the Homestead Steel Works, as has been stated, and the capacity will be increased from 300 to 500 tons a month.

It is unofficially reported that operations have been under way for some time looking to the consolidation of manufacturers of steel plates who are at present independent of the United States Steel Corporation. While it is announced that the new company are to be operated entirely separate from the United States Steel Corporation, it is also said that President Schwab has been actively engaged in bringing the combination about. If the present plans are carried out the new company will be incorporated in New Jersey with a capital of something like \$25,000,000. The consolidation will include the Central Iron & Steel Company of Harrisburg, Pa.; Lukens Iron & Steel Company of Coatesville, Pa.; Worth Brothers, and the Tide Water Steel Company. It has been freely reported that Jones & Laughlins, Limited, of Pittsburgh, the Glasgow Steel Company and the Carbon Company would be represented in the consolidation, but this is officially denied.

The Committee on Trade of the New York Metal Exchange met last Tuesday to consider the proposed new rules to govern sales of copper on the floor of the exchange. There were present R. M. Thompson, Adolph Lewisohn, B. Hochschild, L. Nachmann and Carl Mayer. The committee were unanimously in favor of establishing a contract under which producers, refiners, manufacturers and dealers can safely trade. They were also of the opinion that the time has arrived to make New York the copper market of the world, and it was decided to continue arrangements for carrying out these purposes and when final conclusions have been reached to present them to the board for adoption. The work which the committee has undertaken is held to be of great importance, and will take some time to complete, but the committee expect that trading under the new rules will commence with the beginning of the new year.

The Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, have bought the plant of the New Process Galvanizing Company at Niles, Ohio. This plant will not be removed to Youngstown for two or three months yet.

The Electro-Magnetic Brake Company of Pittsburgh, with a capital of \$5000, was chartered last week. The directors are H. H. Westinghouse of Edgewood, and W. W. Card and E. M. Herr of Pittsburgh. The organization of the company, who are a Westinghouse interest, was decided upon at the last annual meeting of the Westinghouse Air Brake Company, held about six weeks ago. The new company will manufacture a new electro pneumatic brake for use on street cars. The Westinghouse Air Brake Company have been experimenting with these brakes for some time, and a year ago a large number of cars on the Mellon lines were so equipped.

Increased Pig Production.

Stocks Heavily Decreased.

Our reports from pig iron manufacturers show that October was a month of augmented output. The furnaces blown in totaled greater capacity than those blown out, while quite generally the active stacks have been turning out a larger product. At the same time stocks have been cut down heavily, thus verifying the statements made to this effect during the progress of the month. November promises to further increase the strength of the situation, as so many furnaces have had their operations hampered by inability to secure a sufficient supply of coke, owing to the serious shortage of cars.

The weekly capacity of the furnaces in blast on November 1 compares as follows with that of the preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
November 1, 1901.....	249	330,824
October 1.....	246	307,982
September 1.....	255	299,861
August 1.....	257	303,847
July 1.....	249	310,950
June 1.....	252	314,505
May 1.....	256	301,135
April 1.....	250	296,676
March 1.....	248	292,899
February 1.....	245	278,258
January 1.....	233	250,351
December 1, 1900.....	211	228,846
November 1.....	201	215,304
October 1.....	213	223,169
September 1.....	208	231,778
August 1.....	240	244,426
July 1.....	284	285,413
June 1.....	293	296,376
May 1.....	292	293,850
April 1.....	291	289,482
March 1.....	293	292,643
February 1.....	296	298,014
January 1.....	289	294,186
December 1, 1899.....	288	296,959
November 1.....	277	288,522
October 1.....	265	278,650
September 1.....	257	267,335
August 1.....	244	267,672
July 1.....	237	263,363
June 1.....	220	251,062
May 1.....	217	250,065
April 1.....	205	245,746
March 1.....	192	228,195
February 1.....	195	237,689
January 1.....	200	243,516

The condition of the charcoal furnaces at the beginning of the month was as follows:

Charcoal Furnaces November 1, 1901.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New England.....	7	3	258	4	317
New York.....	3	1	780	2	350
Pennsylvania.....	13	2	76	11	470
Maryland.....	4	0	0	4	443
Virginia.....	3	2	74	1	65
Ohio.....	8	1	54	7	489
Kentucky.....	3	0	0	3	300
Tennessee.....	4	2	275	2	280
Georgia.....	4	1	430	3	570
Alabama.....	4	3	1,083	1	329
Michigan, Missouri and Wisconsin.....	10	7	4,039	3	785
Texas.....	4	0	0	4	872
Totals.....	67	22	7,049	45	4,970

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
November 1, 1901.....	22	7,049
October 1.....	25	7,444
September 1.....	22	6,605
August 1.....	22	6,578
July 1.....	22	7,157
June 1.....	22	7,514
May 1.....	23	7,210
April 1.....	26	7,910
March 1.....	26	8,074
February 1.....	31	8,325
January 1.....	32	7,097
December 1, 1900.....	32	6,779
November 1.....	30	7,923
October 1.....	31	8,243
September 1.....	31	8,227
August 1.....	31	8,396
July 1.....	32	8,492
June 1.....	37	7,605
May 1.....	25	6,894
April 1.....	29	7,838

March 1.....	29	7,047
February 1.....	32	8,004
January 1.....	30	7,457
December 1, 1899.....	30	7,511
November 1.....	29	7,113
October 1.....	25	6,229

The condition of the coke and anthracite furnaces at the beginning of the month was as follows:

Coke and Anthracite Furnaces November 1, 1901.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New York.....	14	5	6,752	9	2,857
New Jersey.....	7	4	3,300	3	1,350
Spiegel.....	3	3	511	0	0
Pennsylvania:					
Lehigh Valley.....	26	16	8,855	10	4,778
Spiegel.....	1	1	129	0	0
Schuylkill Valley.....	14	11	8,636	3	1,275
Upper Susquehanna.....	2	1	1,008	1	896
Lower Susquehanna.....	8	5	5,271	3	1,431
Spiegel.....	1	1	504	0	0
Lebanon Valley.....	12	11	8,688	1	518
Pittsburgh District.....	33	28	74,864	5	12,190
Spiegel.....	1	1	2,500	0	0
Shenango Valley.....	16	13	16,623	3	2,794
Western Pennsylvania.....	21	14	19,391	7	3,388
Spiegel.....	1	1	581	0	0
Maryland.....	5	4	6,008	1	1,200
Wheeling District.....	9	9	10,353	0	0
Ohio:					
Mahoning Valley.....	15	14	28,599	1	1,867
Central and Northern.....	14	14	24,120	0	0
Hocking Valley.....	2	1	450	1	400
Hanging Rock.....	12	9	6,494	3	750
Illinois.....	15	15	33,019	0	0
Spiegel.....	2	2	1,673	0	0
Minnesota.....	1	0	0	1	763
Wisconsin.....	4	2	2,608	2	1,474
Missouri.....	1	0	0	1	570
Colorado.....	2	2	5,200	0	0
Spiegel.....	1	1	400	0	0
The South:					
Virginia.....	21	15	9,307	6	3,010
Kentucky.....	5	4	1,813	1	685
Alabama.....	36	21	19,701	15	11,012
Tennessee.....	16	8	6,000	8	3,962
Georgia.....	1	0	0	1	450
North Carolina.....	1	1	437	0	0
Totals.....	323	237	318,775	86	57,550

In comparison with previous months the record of the coke and anthracite furnaces stands as follows in gross tons:

	Number in blast.	Capacity per week.
November 1, 1901.....	237	318,775
October 1.....	221	300,538
September 1.....	233	293,256
August 1.....	225	297,269
July 1.....	227	308,793
June 1.....	232	306,991
May 1.....	233	293,915
April 1.....	225	288,766
March 1.....	222	284,825
February 1.....	214	278,258
January 1.....	201	243,254
December 1, 1900.....	179	222,067
November 1.....	171	207,381
October 1.....	182	214,921
September 1.....	197	223,551
August 1.....	209	226,131
July 1.....	232	274,921
June 1.....	226	288,771
May 1.....	227	286,956
April 1.....	222	281,644
March 1.....	224	285,596
February 1.....	224	290,010
January 1.....	220	286,729
December 1, 1899.....	223	299,448
November 1.....	248	281,409
October 1.....	241	272,428

The furnaces blown in during October comprised one Sacon and one Keystone of the Thomas Iron Company, one Topton, one Crane, one Juniata, one Union at Buffalo, one Bellaire, one Columbus, one Hubbard, one Colorado, one Big Stone Gap, one Princess, one Cranberry, one Ensley, one Woodward and one Goodrich, with one Richmond charcoal. Those blown out were one Durham, one Pennsylvania Steel Company, one Carrie, one Edgar Thomson, one Ivanhoe, one Mayville, one Longdale, one Sheffield and one Woodward, with one Cherokee, one Olive and one Vesuvius charcoal.

Furnace Stocks.

The position of furnace stocks, sold and unsold, as reported to us, was as below on November 1, as compared with the five preceding months, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron:

Stocks.	June 1.	July 1.	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1.
Anthracite and Coke.....	333,518	327,761	328,787	318,009	299,824	223,089
Charcoal.....	73,910	64,837	53,542	62,065	61,769	50,162
Totals.....	407,428	392,598	382,329	380,074	361,593	273,251

MANUFACTURING.

Iron and Steel.

The Jupiter Steel & Coal Company, organized under the laws of West Virginia, are preparing to install machinery in the buildings formerly occupied by the Pennsylvania Lead Company, at Carnegie, a suburb of Pittsburgh. The company will make tool steel and will build two open hearth steel furnaces. A small crucible steel plant will also be built.

The plant of the Eastern Tube Company, at Zanesville, Ohio, whose offices are in Pittsburgh, recently shipped a consignment of pipe to London, England.

The sheet mill plant of the American Sheet Steel Company, at Dennison, Ohio, which was closed temporarily on account of the scarcity of billets, is again in full operation.

Carrie Furnace No. 1 of the Carnegie Steel Company, at Rankin station, Pittsburgh, which was seriously damaged by an explosion when it was started up about two weeks ago, has been repaired and put in operation again. Carrie Furnace No. 2 is nearing completion and will be ready for operation about the first of the year, or perhaps before. These stacks were rebuilt to take the place of the old Carrie stacks, and will have a daily capacity of about 450 tons each. Carries Nos. 3 and 4, which are in operation, are entirely new furnaces and each has a daily capacity of about 600 tons. The total daily output of these four furnaces will be about 2000 tons of metal, all of which will be taken in a molten state by bridge across the river to the Homestead Steel Works.

Joseph Wharton of Philadelphia, Pa., has directed Edward Kelly, manager of the Wharton furnace, at Port Oram, N. J., to prepare the necessary foundations for another new furnace at that place. It will be in all respects similar to the new No. 2 Furnace, which was blown in August 15, and will be 100 feet in height, will have a 21-foot bosh and a 14-foot crucible. The diameter of the bell will be 11 feet. Mr. Wharton has not yet decided when he will go on with the structural work.

The new mill under construction for some time by the New Haven Iron & Steel Company, New Haven, Conn., is nearly completed and the equipment is being installed. It is expected that the mill will be in operation in about two months, when the output of bar iron will be increased one-third.

The Manogue-Pidgeon Iron Company, Memphis, Tenn., importers and jobbers of steel, railway supplies and tin plates, owing to the great increase in business have recently enlarged their main storehouse building by a brick addition, which will double their storage capacity.

The furnace of the Lehigh Steel & Iron Company, in Alneyville, a suburb of Allentown, Pa., which has been idle since June, will shortly blow in.

The Cherokee Furnace, Cedartown, Ga., was blown out October 30 to put in a new hearth.

Bloom Furnace, Bloom Switch, Ohio, has been blown out for repairs.

Durham Furnace, Riegelsville, Pa., was blown out November 1.

Ivanhoe Furnace, Virginia, was blown out October 27 for general repairs. Will probably be out of blast for a couple of months.

Princess Furnace, at Glen Wilton, Va., was blown in on October 31.

The Duncannon Iron Company, Duncannon, Pa., advise us that they are contemplating moving their plant to the Pennsylvania Railroad Company's new line at that place, but as yet no plans have been completed or approved.

It is possible the Burgess Works, owned by the Crucible Steel Company of America, and located at Portsmouth, Ohio, may be sold to other parties who will operate the plant.

The contract for the skelp mill, to be built by the Youngstown Iron, Sheet & Tube Company, at Youngstown, Ohio, has been placed with the United Foundry & Engineering Company of Pittsburgh.

A charter has been granted to the West Carnegie Sheet Steel Company, now building a sheet mill plant at West Carnegie, near Pittsburgh. This company take the place of the Carnegie Sheet Iron Company, chartered some months ago, but a change in the personnel was made and it was decided to take out a new charter. The company have secured 11 acres of land in West Carnegie, on which a three or four mill sheet plant will be built, and which may eventually be increased to ten or eleven mills.

The report that some new mills will be added to the Wells-ville works of the American Sheet Steel Company, Wellsville, Ohio, is incorrect. Ground has been broken for the bed plate of a large new engine to be installed, from William Tod Company, Youngstown, Ohio, and this probably gave rise to the report that some new mills would be added.

It is probable the Pomeroy Mills of the American Steel Hoop Company, at Pomeroy, Ohio, will not again be operated. The best part of the machinery will be removed to other works.

The Detroit Steel & Spring Company, Detroit, Mich., owing to the need of more room to take care of their increasing business, have purchased property adjacent to their plant and have let contracts for the erection of buildings thereon to cover about 50,000 square feet of ground. They expect to have the new buildings under cover by January.

General Machinery.

The Mobile, Jackson & Kansas City Railroad are building new shops in Mobile, Ala. In addition contracts have been let and work is progressing on an extension of the general office building, new round house, car sheds, store house and three piers to deep water.

The Griever & Twaits Company, Cincinnati, Ohio, manufacturers of ornamental wrought iron and metallic art goods, will be in the market for power presses, power riveters, power punches, power shearers, Poppett drop hammers, scroll saws, leather belting, hangers and shafting, complete plating outfit, and entire equipment for gas producing plant, as soon as the new plant they are building at Indianapolis, Ind., is ready for occupancy. The company expect to move to their new location March 1.

The McCormick Harvesting Machine Company, Chicago, Ill., have begun the construction of a five-story brick and stone addition, 83 x 161 feet, to their works on Leavitt street. This new building will cost about \$40,000, and will be the third large addition to the works since July 1.

The Turner Motor Company, 39-41 Cortlandt street, New York City, recently incorporated with a capital of \$500,000 for the purpose of manufacturing motor bicycles and automobiles propelled by rotary steam, gasoline and turbine motors, have about completed the purchase of a site in the Pittsburgh district upon which they will erect a large plant.

The right to manufacture the Moffett roller bearing for road vehicles, which business has been carried on in Chicago for some time, has been secured by Bliss & Van Auken, who are erecting a plant at Saginaw, Mich., to consist of a main building, 48 x 160 feet, one story, with brick vault for tools, &c., and an additional building for blacksmith shop, case hardening furnaces, &c. In due time a company will be organized to manufacture the article. The Moffett Railway Bearing Company have been recently organized with a large capital to manufacture these bearings for railroad work, and now have a 50-ton car in operation on the New York, New Haven & Hartford Railroad.

H. W. Caldwell & Son Company, Chicago, Ill., engineers and machinists, will enlarge their plant by an addition, 70 x 160 feet, which they will use for shipping and warehouse purposes and for the manufacture of sheet metal specialties. The building will relieve the machine shop of a great deal of stock stored therein and will give them about twice the present machine shop capacity.

The Houghton Elevator & Machine Company, Toledo, Ohio, are in the market for a traveling crane, heating apparatus, steam hammer and some new machine tools for a new machine shop, 75 x 120 feet, which they are building. The contract for the building has been let to the Henry Spleker Company. The company will not be ready to take up the matter of machine tools before January, but the other items will be taken up at once.

The Shepler Water Motor Company, P. O. Box 425, Clarksburg, W. Va., recently organized for the purpose of manufacturing water wheels, pulleys, shafting, &c., advise us that they will be in the market in about 60 days for the equipment for their new plant.

The Vicksburg Ice Company, Vicksburg, Miss., have purchased a 60-ton ice machine, manufactured by the York Machine Company.

The Old Colony Street Railway Company, Taunton, Mass., advise us that they have no intention of erecting a machine shop, as reported.

Drane & Co., Clarksville, Tenn., founders and machinists, manufacturers of steam engines, tobacco screws, saw mills, sugar mills, have added a new office and store room to their factory. The addition gives the company increased room to extend their business in mill supplies, at which they are aiming. They have a considerable number of orders for machinery and steam drying equipments for tobacco factories in Tennessee and Kentucky.

The National Machine Company, Hartford, Conn., are enlarging their works. The new equipment has been purchased.

The Taylor Signal Company have decided to double the capacity of their Buffalo works. The new plant will be located on Elmwood avenue, adjoining the New York Central belt line tracks. The new buildings will be of fire proof construction. The main building will be two stories high and 250 feet long, while an office building 50 x 70 feet will be erected. Niagara power will be used in the operation of the new plant, which is expected to be in operation early next spring.

The Union Switch & Signal Company of Swissvale, Pittsburgh, have received an order from the Pittsburgh & Lake Erie Railroad for an automatic electric block signal system on its line between Glassport, Pa., and Youngstown, Ohio, a distance

of 84 miles. Between McKee's Rocks and Glassport the signals will be located 2000 feet apart. At other places, where the traffic is not so heavy, the distance will be 4000 feet. From McKee's Rocks to Coraopolis, between which points the road has four tracks, bridge signals, running overhead across all the tracks, will be used. On the rest of the line each signal will be erected on a pole planted alongside the tracks, each track to have its own poles. This is an innovation from the general system of erecting block signal systems. The signals on the poles will be operated separately by a storage battery planted at the base of every pole. The system will be so devised that a red or danger signal will be thrown when a switch is open, a rail broken or a train running on the next block.

The Youngstown Engineering Company, Youngstown, Ohio, have received a contract from the Sharon Steel Company of Sharon, Pa., for the erection of 40 barb wire machines. The new plant of the Youngstown Engineering Company at Hazleton has an abundance of orders and every department so far completed is working to full capacity.

From \$75,000 to \$100,000 will be spent by the Fred Macey Company, Limited, makers of furniture, for the equipment of the portion of their new plant now under course of construction. The contract, covering one-quarter of the completed plans, has been let. The building when completed will be 300 x 900 feet, of brick and thoroughly modern in construction and equipment. Dry kilns, lumber sheds, &c., will also be erected. The plant will cover a 12-acre site 1 mile within the city limits of Grand Rapids, Mich.

The Keystone Driller Company, at Beaver Falls, Pa., have finished the erection of two new steel and stone buildings, each 40 x 200 feet, and which have been equipped with new machinery for the manufacture of portable drilling machines, and which will about double the capacity of the plant. A new brick office building is being built by this concern.

The Cambria Foundry & Machine Company of Johnstown, Pa., will probably make some large additions to their plant.

Tate, Jones & Co., Incorporated, Empire Building, Pittsburgh, have recently received contracts for a large amount of conveying machinery. Among these orders is a large conveyor for the Davis Coal & Coke Company of Thomas, W. Va., to be used in taking coal from the mouths of the mine to the tipple. The same concern are furnishing a conveyor to the National Malleable Casting Company, at Sharon, Pa., to be used for carrying coal from the cars to the furnaces and gas producers. Tate, Jones & Co., Incorporated, are building a new works at Leetsdale, Pa., a few miles below Pittsburgh, on the Fort Wayne Railroad, and which will adjoin the large new works of the Riter-Conley Mfg. Company at that place.

Boilers, Engines and Accessories.

Owing to the amount of work on hand, the Northwestern Machine & Boiler Works, West Superior, Wis., will build an addition, 50 x 60 feet, to the boiler shop, and will enlarge the machine shop. An equipment of air tools will be installed, all of which have been purchased.

The W. T. Adams Machine Company, Corinth, Miss., manufacturers of automatic and slide valve engines, boilers and saw mills, have lately installed a complete electric light plant for the city of Juka, Miss., using one of their 100 horse-power high grade automatic engines, of which they make a specialty for this purpose. They have also installed two 150 horse-power high pressure boilers, to run the new cotton mill erected at the experimental station of the Agricultural and Mechanical College at Starkville, Miss., and also for heating the dormitories. The company have a large number of orders in hand for saw mills, planing mills, &c.

Dravo, Doyle & Co., engineers, with offices in the Lewis Building, Pittsburgh, have purchased the entire equipment of two power plants of the Cincinnati Gas & Electric Company of Cincinnati, Ohio. The machinery includes ten compound Corliss engines, ten compound Buckeye engines, several automatic engines, generators, tubular boilers, &c.

Samuel Stephens, 174 Fort Hill square, Boston, Mass., manufacturer of printing machinery and material, is in the market for a good second-hand 25 horse-power Corliss engine. The concern have purchased land in Somerville and have plans for the erection of three buildings, each to contain about 8400 square feet of floor space. The first of the buildings is expected to be completed in January.

A new equipment will be required by the Mount Holly & Burlington Traction Railway of Mount Holly, N. J. Their plant was recently destroyed by fire. The property was owned and operated by the Pennsylvania Railroad.

The boiler works of Reeves Brothers, at Alliance, Ohio, which were destroyed by fire some time since, will be rebuilt on a much larger scale. All the buildings are to be built of brick and steel and will be put up by the American Bridge Company of Pittsburgh. The new erecting room will be 43 feet wider than the former one, hence its dimensions will be 108 x 207

feet. The engine, blacksmith and machine room will be 42 feet wider than the former building and its dimensions will be 107 feet in length and 98 feet in width. The construction room will be 100 x 250 feet.

The Olds Motor Works, Detroit, Mich., manufacturers of gas and gasoline engines, have about completed their new plant and are now installing the machinery. They expect to be in full operation by the middle of December.

Baldwin, Tuthill & Bolton, Grand Rapids, Mich., manufacturers of machinery, are building a new boiler and engine house, the equipment for which has been purchased.

Atlas Engine Works, Indianapolis, Ind., have just completed and put in operation a new boiler shop, 70 x 900 feet, with wing 60 x 365 feet, equipped with independent power house, &c.; new forge shop, 50 x 205 feet; new machine foundry, 70 x 300 feet. They are also just getting under roof a heavy casting foundry 120 x 500 feet. The walls are half up for a new machine shop, 50 x 322 feet, three stories. Plans are prepared for a new central power station and a central melting plant. The new buildings and their equipment involve an expenditure of about \$700,000.

Fires.

The power house of the Mount Holly & Burlington Traction Railway, at Mount Holly, N. J., was recently destroyed by fire, entailing a loss of \$20,000. The property was owned and operated by the Pennsylvania Railroad Company.

The American Die & Tool Company, Reading, Pa., lost their hardening and tempering department by fire on the 8th inst. They advise us that they will be inconvenienced for about a week while rebuilding, after which time they will be able to serve their customers as usual.

Considerable new machinery will be required by Robert H. Foederer, leather manufacturer, Philadelphia, Pa., to replace the machinery lost in the fire which recently destroyed about one-third of his plant. The loss will exceed \$300,000.

The Glendon rolling mills of Dilworth, Porter & Co., on the South Side, Pittsburgh, were completely destroyed by fire last week, causing a loss of \$250,000 or more. The concern are manufacturers of the "Goldie" railroad spikes and track material. The plant will be rebuilt and probably on a much larger scale.

The plant of the American Laundry Machinery Company, at Cincinnati, Ohio, was last week destroyed by fire. The loss is about \$70,000.

The building occupied by the St. Louis Iron & Steel Foundry Company and the Rice Coil Spring Company was destroyed by fire recently. The loss on machinery and building is about \$10,000.

Fire last week at the works of the Monongahela River Consolidated Coal & Coke Company of Pittsburgh, Pa., at Six Mile Ferry, caused a loss of \$25,000.

The plant of the Lawrence Ice & Storage Company, New Castle, Pa., was gutted by fire November 10. The damage amounts to at least \$150,000. The plant was only completed this fall, and all the expensive machinery was destroyed.

The plant of the Pittsburgh Oil Refining Company at Coraopolis, Pa., was destroyed by fire last week, entailing a loss of about \$70,000.

The plant of the Logan Milling Company, Logansport, Ind., was entirely destroyed by fire November 11. The milling company's loss, \$40,000; insurance, \$16,000.

The works of the Paterson Iron & Steel Forge Company, Paterson, N. J., were totally destroyed by fire November 11. The loss is said to be about \$50,000. The works had been partly idle for years.

The boiler shop of William Campbell & Co., successors to Allen & Endicott, near Broadway, Cambridgeport, Mass., was destroyed by fire November 9. Machinery, stock and valuable patents, valued at \$12,000 to \$15,000, were burned. The loss is covered by insurance.

Nache & Sons, Philadelphia, Pa., machinists, lost most of their machinery by fire recently.

The plant of the Easton Turning & Enameling Company, Easton, Md., was recently destroyed by fire.

John Clark, Philadelphia, Pa., lost \$5000 by fire, which destroyed his foundry last week. The loss is fully covered by insurance.

Foundries.

Frederick Bauch, Alliance, Ohio, manufacturer of gray iron castings, has completed an addition, 50 x 60 feet, to the foundry, and is now prepared to make castings up to 3000 pounds.

The Ideal Foundry Company, Miles Grove, Pa., have incorporated with a capital of \$40,000, and have purchased the plant at Ashtabula, Ohio, formerly occupied by the International

Stove & Mfg. Company. The plant is fully equipped with all modern conveniences, and as soon as possible the company will move their business to the new location. The change will be made, however, not later than January 1.

The Sanford-Day Iron Works, recently incorporated, have succeeded to the business and plant of the A. B. Day Foundry Company. A new molding room, 60 x 120 feet, is now under construction and other improvements to the plant will be made. The company will later on put on the market a line of stoves. The officers are E. J. Sanford, president; A. B. Day, vice-president and general manager, and Hugh W. Sanford, secretary and treasurer.

The new foundry now being built by the Vilter Mfg. Company at Milwaukee, Wis., is rapidly nearing completion and is expected to be ready for occupancy by December 1. The building is of brick and steel, 110 x 280 feet, and will be equipped with all modern conveniences.

Geo. D. Roper and his associates, M. J. Green and Wm. Gaffney, in the Eclipse Gas Stove Company, Rutherford, Ill., have purchased the interests of S. S. Brumbaugh and C. H. Hopke in the American Foundry Company of that city. At present no changes will be made, except the release of Mr. Hopke, who will have no further connection with the foundry, and no new equipment will be required.

Bridges and Buildings.

The Des Moines Bridge & Iron Works, Des Moines, Iowa, will build an addition, 100 feet long, two stories, to the main shop, the equipment for which has been purchased.

The contract for the erection of a 22-story office building for the Farmers' Deposit National Bank, at the corner of Fifth avenue and Wood street, Pittsburgh, has been given to the George A. Fuller Company of New York. This concern are erecting the Frick Building in Pittsburgh, on which fast progress is being made. The first five stories of the new building will be of marble and the other stories of brick. From 5000 to 6000 tons of structural material will be used for the building.

Hardware.

American Stove Board Company, Chicago, have prepared plans and specifications for a large factory building to be erected on property adjoining the present site of the company's works. The new building will be nearly double the size of any of the present structures, and will enable the company to greatly facilitate their work, as well as to give employment to several hundred additional workmen.

Union Lock & Hardware Company, Lancaster, Pa., have disposed of all their rights and interests in the manufacture of padlocks and night latches, together with all their stock, materials, patents, patterns, trade-marks, &c., to E. T. Fraim, proprietor of the Keystone Lock Works of that city, who will hereafter put the goods on the market.

The American Car & Ship Hardware Mfg. Company, New Castle, Pa., manufacturers of brass goods, have during the last month made the following additions to their plant: Metal pattern room, 20 x 25 feet; new polishing room, 15 x 75 feet; new packing and stock room, two stories, 26 x 30 feet, and new shipping room, 26 x 50 feet. The company are running their plant night and day on orders from the American Car & Foundry Company, at Wilmington, Del.

The Bronson-Walton Company, Cleveland, Ohio, makers of coffee mills, roasting pans and hardware specialties, have moved into their new plant, which has been building during the summer. They have added new machinery which will double their capacity. They report plenty of orders and are running a night force. One hundred men are employed.

New Departure Bell Company, Bristol, Conn., are making an addition to their plant in the shape of a one-story brick structure about 55 x 60 feet.

Fayette R. Plumb, Incorporated, have recently purchased a plot of ground, 290 x 130 feet, adjoining their plant in Frankford, Philadelphia, Pa., and contemplate making improvements that will increase the capacity of the works about one-half. Additional facilities for the shipment of goods have already been made which enable them to better take care of that portion of the business.

Clason Architectural Metal Works, Providence, R. I., are now operating their new factory on Kinsley avenue, which is well equipped for turning out a large variety of metal work. We are advised that this concern are executing an extensive order for fire proof metal book stacks for the Sayles Library, Pawtucket, R. I., and are also engaged on a number of important contracts for skylights, metal window frames and cornices. They are making a lot of large copper revolving ventilators with cowls, for a public institution.

W. C. Starr & Son, Richmond, Ind., are running their plant full on chain and are also the recipients of many orders for special work from large breweries for harness embellishments all over the West.

M. C. Henley, Richmond, Ind., is enjoying quite a foreign trade on two of his leading products, roller skates and bicycles,

quite a large order for the latter being received from Yokohama, Japan, from a native firm whose representative recently visited the Henley works.

The Richmond Shovel & Tool Works, Richmond, Ind., are operating their plant to the full extent of its present capacity.

Miscellaneous.

Capitalists of Monmouth, Ill., have under way a project for the establishment of a large plant in that city for the manufacture of plows and other agricultural implements, designed and patented by W. T. Brunner, late of the Bradley Plow Company, Kankakee. It is proposed to organize a company with \$100,000. W. S. Weir, president of the People's National Bank, is interested.

It is probable that a company will be organized with a capital of \$30,000 to manufacture steel wheels at Pontiac, Mich. F. G. Jacobs, Everett Todd, E. H. Halsey and W. J. Fisher of that city are interested in the enterprise.

R. J. Gatling, 3650 Lindell Boulevard, St. Louis, Mo., the inventor of the rapid firing gun, and other St. Louis capitalists have under consideration the organization of a company with \$1,000,000 capital to manufacture a plow and other agricultural implements, manufactured by Mr. Gatling. It is proposed to erect a large plant in St. Louis.

The firm of Somers, Fittler & Clarke, Limited, of Pittsburgh, who carry on the business of manufacturing and selling all kinds of supplies for contractors, mills, mines, furnaces, foundries, railroads and other industries, have decided to reorganize their firm as the Somers, Fittler & Todd Company. The new company will make application for a charter in a short time. The officers are William Todd, chairman; T. K. Fittler, secretary; L. S. Clarke, treasurer, and W. A. Somers, manager. These are also the incorporators of the new company.

Negotiations are under way for the erection of a large plant at Sheffield, Ala., for the manufacture of Capt. J. M. Brosius' no treadle sewing machine. The agency for the machine for Canada, England and Spain has been sold and the machines will be manufactured wherever Captain Brosius may locate his plant. His headquarters are with N. F. Thompson & Son, Sheffield, Ala.

Florsheim & Co., Milwaukee, Wis., manufacturers of shoes, whose plant was recently destroyed by fire, will shortly rebuild on a new site. The plans call for a five-story brick and stone factory, 175 x 150 feet, which will be equipped with all modern conveniences. The building will cost \$60,000.

The Phoenix Silk Mfg. Company will increase the capacity of the Adelaide Mill, in Allentown, Pa., and will place \$15,000 worth of new machinery in the mill at Pottsville.

The Jacksonville Knitting Company have let the contracts and purchased all the machinery for the new plant they are erecting at Jacksonville, Fla.

At Twenty-eighth and Chestnut streets, Quincy, Ill., A. C. Bickhaus, proprietor of the Gem City File Works, has secured a site, where in the spring he will erect a new plant. It is his intention to increase the present output three times.

The St. Charles Electric Light & Power Company, St. Charles, Mo., have been incorporated with a capital of \$30,000 by J. D. Henseman, F. E. Niesen and W. J. Murray. A plant has been purchased which will be materially enlarged.

The Cherokee Falls Mfg. Company, Cherokee Falls, S. C., have let the contract for a large addition to their plant. It is probable that considerable new machinery will be required.

A canning factory is about to be established in Cohoes, N. Y. The stock has all been subscribed and a meeting of the stockholders will be held November 12 to organize. It is the intention of the company to erect a plant to cost about \$10,000, the contract for which will probably be awarded to O. Pressprich & Co. of Chicago. Several of the members of the Business Men's Association of Cohoes are interested, and information concerning the project may be obtained from that body.

The J. W. Wharf Company, 128 Sumner street, Boston, Mass., have been organized for the purpose of manufacturing etched brass, zinc, aluminum and glass signs for advertising purposes. The company are putting in practically an entirely new plant.

J. H. Estes & Sons, Fall River, Mass., manufacturers of twines, yarns, &c., have completed the new additions to their plant and are now installing new machinery.

The Cole Mfg. Company, Chicago, Ill., advise us that owing to the large increase in business they expect shortly to add a considerable amount of new equipment to their plant. They are now breaking ground for the erection of a fire proof warehouse, 150 x 50 feet, three stories. The company manufacture stoves and ranges.

The Kennedy & Morelock Stave Company, Memphis, Tenn., have purchased 4½ acres of land in South Memphis, where they will erect a tight band stave and heading plant. Most of the machinery has been purchased.

Nelson Story & Co., Bozeman, Mont., will receive bids for the erection of the buildings and equipment for their new flour mill, to cost about \$45,000, and the equipment to cost \$30,000.

The buildings will be of brick and fire proof, and the contracts will be let in January.

The Brookside Mills, Knoxville, Tenn., advise us that they are making no changes or additions to their plant, as reported.

The Worumbo Mill Company, Lisbon Falls, Maine, have purchased the Androscoggin Water Power Company's saw mill.

The Wason Mfg. Company, Springfield, Mass., will start at once upon the erection of an addition, to be used for a car erecting shop.

Wetterhold & Nudd, Wichita, Kan., mattress manufacturers, are erecting a new brick factory, 40 x 120 feet, and a two-story corrugated iron warehouse, 32 x 130 feet. The present equipment of machinery will be moved into the new plant, which will be ready for occupancy January 1, and some new machinery will be added to increase the capacity.

The Moline Pump Company, Moline, Ill., have purchased the ground at Fourth avenue and Twenty-first street, which they expect to improve in the spring. It is probable that additional buildings will be erected upon it.

The Stevens Woolen Mill, Haverhill, Mass., are building a four-story brick addition, 37 x 40 feet, to their plant.

The Electrolysis Proof Conduit Mfg. Company, manufacturers of a patented tube or cover for underground wires, have located in the former plant of the Chicago Brass Bed Mfg. Company, at West Pullman, Ill.

The Louis Lipp Company, Cincinnati, Ohio, have broken ground for the erection of a new plant. It will consist of two wings, each 60 x 520 feet, and will include foundry, enameling room, tin shops, machine shop, engine and boiler rooms, shipping department and offices. The buildings will be one-story, of brick and iron, and will cost about \$75,000. The company manufacture plumbers' supplies.

The Ohio Galvanizing & Machine Company have let contracts for the erection of their new plant at Niles, Ohio. The main building will be 50 x 200 feet.

A. Leschen & Sons' Rope Company have just moved their Chicago office from South Canal street to 137 Lake street, where they will have a large warehouse and will carry a complete stock of wire, manilla and sisal rope, packing, waste, pulley blocks, sheaves, wire fittings and various kinds of supplies. The company manufacture the Hercules brand of wire rope, patent flattened strand wire rope and patent aerial wire rope tramways. Their factory, main office and warehouse are located at St. Louis. They also have branch offices and warehouses at 92 Centre street, New York City, and 85 Tremont street, San Francisco, Cal.

The Mallard Lumber & Bobbin Company, Greenville, S. C., have been organized with a capital of \$50,000 for the purpose of manufacturing bobbins, spools and skewers and for operating a general wood working plant in connection with a lumber yard. A new building has been erected which will be equipped with modern machinery, all of which has been bought. E. G. Mallard is president.

Record Breaking at Duquesne and Homestead.—The Bessemer department at the Duquesne Steel Works of the Carnegie Steel Company, at Duquesne, Pa., turned out last month 55,521 tons, a gain over the best record for one month of 2332 tons. The basic open hearth department turned out 40,321 tons, an increase over the best previous month of 1917 tons. In the 21-inch mill 51,936 tons of billets were produced, which exceeds all previous records by 3859 tons. The 10-inch merchant mill was placed in operation on October 5, and for the balance of the month 3445 tons of finished steel were produced. During the month of October the Homestead plant broke all records in the production of armor plate, sheared and universal plates, structural material and Bessemer and open hearth ingots, blooms and slabs. The total production of the plant will exceed the best record by about 10,000 tons. One turn on the 34-inch mill produced 2500 tons of material, as compared with 2200 tons of best previous record. During the month the last of the Russian armor plate contracts were disposed of, and the entire plant was turned on armor plate for American ships.

It is probable a number of blast furnaces in the Mahoning and Shenango valleys will be compelled to bank this week on account of lack of coke. J. G. Butler, Jr., chairman of the Mahoning and Shenango Valley Association, says the situation is very serious and with little prospects of relief until navigation on the lakes closes, and the cars which have been diverted to the ore and coal trades are again used for the hauling of coke.

OBITUARY.

A. B. MEEKER.

Arthur B. Meeker of Chicago, formerly one of the most conspicuous iron and coal men in the West, died on the 6th inst. at the residence of his sister in Utica, N. Y., aged 66 years. He had been an invalid for a long time. Mr. Meeker was born in Utica, July 20, 1835. He attended Hamilton College, and at the age of 18 left that institution and engaged in business with his father, Moses Taylor Meeker, who was a well-known coal dealer of Utica. He removed to Chicago in 1857, established a dock and yard at 7 North Market street, and during the seven years which followed his business, including the iron which he handled, amounted to \$10,000,000. Mr. Meeker first became interested in the Wilmington Coal Mine in Illinois when he took up that line of work, and he was also long engaged in the anthracite coal trade in connection with the Lehigh Valley Railroad Company and with Judge Asa Packer of Pennsylvania, president of the road. When Mr. Meeker began the business of mining bituminous coal that industry was in its infancy in Illinois, and he probably did more than any one to make coal so cheap in Chicago that manufacturers would see in that city peculiarly strong attractions. The first cargo of Scotch iron ever shipped from Glasgow to Chicago without breaking bulk was imported by A. B. Meeker & Co. in 1859. Although the firm have since gone out of existence, at one time the only bonded yard in Chicago was devoted exclusively to the storage in bond of the imports of this firm. They also had an immense trade in domestic iron. Mr. Meeker was president of the Menominee Iron & Mining Company, and by his efforts the production of the Lake Superior iron mines was enlarged and their sales extended among manufacturers of the West. He also did much toward building up the iron and steel industry in and about Chicago. He erected the first blast furnace in Chicago, locating it in the district known as Bridgeport. He was the projector, and for several years president, of the Joliet Iron & Steel Works, which opened in 1869, costing \$2,500,000. He also was extensively interested in the iron business in St. Louis up to 1875. His widow, a son and two daughters survive him.

NOTES.

EDGAR A. SHEBLE, one of the most prominent manufacturers and business men of St. Louis, Mo., died on October 30, at his home in that city, from malarial fever, aged 57 years. He was born in St. Louis, and became connected with the St. Louis Sewer Pipe Works. Later he organized the Brislin-Sheble Mfg. Company. At the time of his death he was president and a large stockholder of the Aetna Iron Works.

JOHN POWERS of the Powers Foundry Company, Elkton, Ind., died on October 29 of Bright's disease, aged 77 years. Mr. Powers was a native of Ireland, and went to Baltimore when a young man, engaging there in the iron business. Ten years ago he purchased the Elkton Foundry, which he operated in conjunction with his son, James F. Powers.

CAPT. REDFORD W. SARGENT, marine superintendent of the Cramp shipyard in Philadelphia, died on November 8, of heart disease, aged 60 years.

Banner Month at Ohio Works.—October was a banner month for production at the Ohio works of the National Steel Company at Youngstown, Ohio. Nos. 1 and 2 furnaces made new records and the total output of pig iron in October also established a new record. In the converting mill one turn in 12 hours made 131 heats, while in 24 hours 257 heats were made. In the blooming mill one turn rolled 525 ingots, while for the 24 hours the record was 1040 ingots. The finished tonnage of billets, sheet and tin bars was the largest in any one month in the history of the works. The plant has been idle for a few days, undergoing repairs, but will likely resume this week on billets and tin bars, and will continue on these products until January 1, when the mill will return to rails. All of the rail mill men who want work are being given other jobs in the mill until it returns to rails.

The Iron and Metal Trades.

Our reports from the Pig Iron manufacturers covering production in October show that the month was a record breaker. The output reached the great total of 1,400,000 tons, or at the rate of 16,800,000 tons per annum. The furnaces in blast on November 1 had a weekly capacity of 320,824 tons, based on their actual yield in October. This is in excess of any previous record. The Coke and Anthracite furnaces reporting stocks, comprising practically all the furnaces making Foundry and Forge Iron, had only 223,089 tons on hand November 1, against 299,824 tons October 1, which is a reduction of 76,735 tons. The Charcoal furnaces reported a reduction of 11,607 tons in the same time. This is the heaviest reduction in stocks made in a single month in a long period, and it was made concurrently with a great increase in production. It would be difficult to find stronger evidence of the activity now prevailing in the Iron trade, or a better basis on which to form the opinion that prices are not likely soon to recede. It is in fact well for consumers that the control of the market is in strong hands, as a little injection of the speculative spirit could easily send values considerably higher. But speculative purchases seem to be absolutely lacking in Pig Iron as well as in other Iron or Steel products. The Pig Iron situation is further strengthened by the great difficulty still experienced in securing Coke by reason of the shortage of cars. More furnaces have been banked in the Central West during the week, and the production for this month will be curtailed to a considerable extent. This will particularly affect the output of Steel, the supply of which was not equal to the demand when everything was running smoothly in October.

Pig Iron for steel making is in sharp demand. A 3000-ton lot of Cornwall Bessemer was taken at an advanced price. Basic Pig is about 25 cents higher at Eastern furnaces, with a great deal of business under negotiation. Some large contracts have been placed for Steel Rails, including 55,000 tons by the Baltimore & Ohio, 50,000 tons by the Illinois Central road, and 40,000 tons by the Wabash. Railroad companies that have not yet arranged for their next year's requirements will not now be able to get orders in for summer delivery except for small lots. The important statement is made that the Rail mills of the United States Steel Corporation have their total output for 1902 under contract. Among the orders placed for Structural Steel the largest was for 17,000 tons for the Atlantic avenue improvement of the Long Island Railroad in Brooklyn.

The American Shipbuilding Company have contracted for a large tonnage of Plates for lake vessels. The probabilities now point to a consolidation of several important Plate mills in Eastern Pennsylvania.

The continued scarcity of Steel Billets is shown by a sale of German Sheet Bars for delivery in December. The price made is about \$29, ex ship.

The price of Bar Iron has been reduced \$1 per ton to buyers west of Pittsburgh, which brings it in line with Steel Bars.

A sharp advance has occurred in Pig Tin, caused by the demand for spot lots. The price is up fully $\frac{3}{4}$ cent. Copper Wire has been cut $1\frac{1}{4}$ cents by one of the leading companies.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

PIG IRON:	Nov. 13, 1901.	Nov 6, 1901.	Oct. 16, 1901	Nov. 7, 1900
Foundry Pig, No. 2, Standard, Philadelphia.....	\$15.25	\$15.25	\$15.00	\$15.25
Foundry Pig, No. 2, Southern, Cincinnati.....	13.75	13.75	13.75	12.95
Foundry Pig, No. 2, Local, Chicago.....	14.75	14.75	14.75	14.50
Bessemer Pig, Pittsburgh.....	16.00	16.00	15.85	13.25
Gray Forge, Pittsburgh.....	14.50	14.10	14.15	12.75
Lake Superior Charcoal, Chicago..	17.00	17.00	17.00	17.00

BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh (nom)....	27.00	27.00	26.50	17.50
Steel Billets, Philadelphia (nom)...	29.00	28.00	...	20.00
Steel Billets, Chicago, (nom).....	...	...	...	19.50
Wire Rods (delivered).....	35.00	35.00	34.50	33.00
Steel Rails, Heavy, Eastern Mill..	28.00	23.00	23.00	26.00
Spikes, Tidewater.....	1.80	1.80	1.80	1.40
Splice Bars, Tidewater.....	1.50	1.50	1.50	1.25

OLD MATERIAL, PER GROSS TON:

O. Steel Rails, Chicago.....	14.00	14.00	14.00	10.00
O. Steel Rails, Philadelphia.....	17.00	17.00	17.50	15.00
O. Iron Rails, Chicago.....	21.00	21.00	21.00	16.00
O. Iron Rails, Philadelphia..	21.00	21.00	19.00	16.50
O. Car Wheels, Chicago.....	16.00	16.00	16.00	15.00
O. Car Wheels, Philadelphia (nom)...	16.50	16.00	16.50	16.50
Heavy Steel Scrap, Chicago.....	13.50	13.50	13.50	9.50

FINISHED IRON AND STEEL, PER POUND:

Refined Iron Bars, Philadelphia...	1.65	1.65	1.60	1.25
Common Iron Bars, Chicago.....	1.65	1.70	1.70	1.30
Common Iron Bars, Youngstown..	1.55	1.60	1.55	1.30
Steel Bars, Tidewater.....	1.63 $\frac{1}{4}$	1.63 $\frac{1}{4}$	1.63 $\frac{1}{4}$	1.25
Steel Bars, Pittsburgh.....	1.53	1.50	1.50	1.15
Tank Plates, Tidewater.....	1.75	1.75	1.75	1.38
Tank Plates, Pittsburgh.....	1.60	1.60	1.60	1.25
Beams, Tidewater.....	1.75	1.75	1.75	1.05
Beams, Pittsburgh.....	1.60	1.60	1.60	1.50
Angles, Tidewater.....	1.75	1.75	1.75	1.55
Angles, Pittsburgh.....	1.60	1.60	1.60	1.40
Skelp, Grooved Iron, Pittsburgh..	1.80	1.80	1.90	1.55
Skelp, Sheared Iron, Pittsburgh..	1.85	1.85	2.00	1.50
Sheets, No. 27, Pittsburgh.....	3.00	3.00	3.15	2.80
Barb Wire, f.o.b. Pittsburgh.....	2.90	2.90	2.90	2.80
Wire Nails, f.o.b. Pittsburgh.....	2.15	2.20	2.30	2.20
Cut Nails, Pittsburgh.....	2.05	2.05	2.05	1.95

METALS:

Copper, New York.....	16.85	16.85	16.85	16.75
Spelter, St. Louis.....	4.13 $\frac{1}{4}$	4.13 $\frac{1}{4}$	4.10	4.00
Lead, New York.....	4.37 $\frac{1}{4}$	4.37 $\frac{1}{4}$	4.37 $\frac{1}{4}$	4.37 $\frac{1}{4}$
Lead, St. Louis.....	4.25	4.25	4.25	4.23 $\frac{1}{4}$
Tin, New York.....	25.30	24.60	24.85	28.00
Antimony, Hallett, New York....	8.37 $\frac{1}{4}$	8.37 $\frac{1}{4}$	8.50	9.50
Nickel, New York.....	60.00	63.00	60.00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.19	4.19	4.19	4.10

Chicago.

FISHER BUILDING, November 13, 1901.—(By Telegraph.)

There is a noticeable disposition among metal buyers in the West to stock up a little. This policy is doubtless fostered by the continued car shortage. The situation in that respect is not improving. The slight difference, if any, is rather the other way. Some mills that have had difficulty previously in filling specifications because of a surplus of orders have the added obstacle of lack of transportation facilities, and buyers have taken alarm to a limited extent. There is continued buying of cars by the railroad companies, but no immediate prospect of better service. This stimulated specification of products is seen in Structural Shapes, and in Pig Iron to a marked degree. New orders booked are mainly for deliveries running through the first half of 1902. Trade is generally active. More than 50,000 tons of Standard Sections of Steel Rails have been sold within a week, the business going almost exclusively to Eastern mills. Light Rails also have sold freely at slightly advanced prices for deliveries three months ahead.

Pig Iron.—One of the furnaces of the Illinois Steel Company banked its fires for 12 hours last Monday, because of a lack of Coke. The Northwestern Furnace is still idle, and the second furnace of the Iroquois Iron

Company also, because of no fuel. The railroads are promising nothing by way of improvement, and for several of the furnaces there is a constant struggle to keep going. There has been a good active week in sales, the aggregate being at least from 15,000 to 20,000 tons. Perhaps half the business was in lots running from 500 to 1000 tons, the buyers providing for wants during the first half of 1902 usually. Trade has been stimulated also by the persistence of reports that Southern Irons were on the point of advancing, activity being the more marked in the Southern products. Some furnaces have raised prices 25c., but there is no general advance. Foundrymen have trouble in getting old orders filled not unfrequently, and there is a good demand for all the product of the furnaces that arrives, and any temporary surplus being quickly absorbed. Local Irons are firm at unchanged prices, as follows:

Lake Superior Charcoal.....	\$17.00 to \$18.00
Local Coke Foundry, No. 1.....	15.25 to 16.00
Local Coke Foundry, No. 2.....	14.75 to 15.25
Local Coke Foundry, No. 3.....	14.25 to 14.75
Local Scotch, No. 1.....	15.25 to 16.00
Ohio Strong Softeners, No. 1.....	17.00 to 17.50
Southern Silvery, according to Silicon.....	15.65 to 16.00
Southern Coke, No. 1.....	15.15 to 15.40
Southern Coke, No. 2.....	14.40 to 14.65
Southern Coke, No. 3.....	13.90 to 14.15
Southern Coke, No. 1 Soft.....	15.15 to 15.40
Southern Coke, No. 2 Soft.....	14.40 to 14.65
Foundry Forge.....	13.40 to 13.65
Southern Gray Forge.....	13.15 to 13.40
Southern Mottled.....	13.15 to 13.40
Southern Charcoal Softeners, according to Silicon.....	15.50 to 16.50
Tennessee Silicon Pig.....	16.40 to 16.65
Alabama and Georgia Car Wheel.....	19.50 to 20.50
Malleable Bessemer.....	15.75 to 16.00
Standard Bessemer.....	15.75 to 17.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	15.75 to 16.25

Bars.—Makers of Iron Bars have reduced the price 1 per ton, and Iron and Steel Bars are now selling at the same price. The notice of this reduction was generally unexpected and has temporarily checked the demand. It was at first taken to mean that weakness had developed, but that interpretation is discarded by the mill owners. The occasion for the reduction is attributed partly to a desire to establish a parity between Iron and Steel prices, and partly to the more or less unsatisfactory level of Scrap prices. The largest producer of Bars has recently put into operation a continuous mill, and another is soon to be started. Deliveries which have been backward from this cause will greatly improve, as the new output will be about 500 tons per day. We quote 1.65c. for Common Iron and Soft Steel Bars. Quotations from stock are unchanged, 1.90c. to 2c. for Steel Bars, 2c. for Iron and 2.50c. for Steel Hoops.

Structural Material.—An office building to be erected at Birmingham, Ala., and requiring about 900 tons of Shapes has been let and the material sold. There is delay in deliveries of Structural Material, and current demand, in a small way, is above the normal for this season. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—One reason for the relative quiet in Plates, as compared with some other finished products, is that consumers, noting the comparative easiness of the Plates, are not specifying in so forehanded a manner as elsewhere in the market. Thus bridge builders and car makers who consume both Shapes and Plates are specifying for the former and not the latter, when both are wanted for the same work, for the advance specification necessary in the former is not needed in the latter. There is quite a fair consumption of Plates, and prices are without change. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank, and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—Mill shipments are large, for the scarcity of months ago is not wholly relieved. However, the situation is more comfortable. While some quotations of No. 27 Common are 3.50c., store trade is quite common-

ly 3.60c. to 3.80c. for that size. Galvanized trade is good, with prices steady at 65 and 10 to 70.

Merchant Pipe.—Expecting moderate trade, sellers of Merchant Pipe are well satisfied with prevailing conditions. The volume of demand is excellent for the middle of November. Carload lots are now quoted as follows, random lengths: Black, ½ to ½ inch, 60 off; ¾ to 10 inches, 67 off; Galvanized, ½ to ½ inch, 47 off; ¾ to 6 inches, 55 off.

Boiler Tubes.—There is a steadiness in the demand for Boiler Tubes, which shows continued large consumption. No variation in prices are to be noted. Quotations are as follows:

	Steel.	Iron.
2½ to 5 inches.....	57½	47½
1½ to 2½ inches.....	50	40
1 to 1½ inches.....	35	30
6 inches and larger.....	52½	45

Rails and Track Supplies.—One order closed this week was for 30,000 tons, another for 10,000 tons, and a third for 7000 tons. An aggregate of over 50,000 tons went to Eastern mills because of better deliveries possible. Light Rails also are moving well. Mills are sold ahead for from 60 to 90 days, and small users are buying eagerly for deliveries for the middle of January. Coal operators and other small buyers are driven to the necessity of using 4 x 4 timber for trackage, because of scarcity for quick shipment. Standard Sections are firm at \$28, and Light Rails are slightly higher at \$30.50 to \$35. Track Fastenings are active and strong. They are quoted as follows: Splice Bars, 1.65c. to 1.75c.; Spikes, 2c. to 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

Merchant Steel.—One large producer reports the tonnage for October the heaviest for any October in his history, exceeding the previous banner October of two years ago. November is developing continued inquiry, and mills are considerably behind in shipping. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6½c. for carloads and 7c. to 7½c. from store; Specials, 12c. upward.

Old Material.—Uncertainty still rules the Old Material market. Buyer and seller are both playing strongly for position. The latter has a large tonnage in store, and is slow to modify terms. The former is aided statistically by the decline of Bar Iron prices. Transactions are comparatively small and unimportant, but vary widely. Some have been at figures above the quotations below. Other transactions have been lower than these quotations, urgency either with the buyer or seller dictating the terms. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$21.00 to \$21.50
Old Steel Rails, mixed lengths.....	14.00 to 14.50
Old Steel Rails, long lengths.....	18.00 to 18.50
Heavy Relaying Rails.....	25.50 to 26.00
Old Car Wheels.....	16.00 to 16.50
Heavy Melting Steel Scrap.....	13.50 to 14.00
Mixed Steel.....	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates.....	\$17.50 to \$18.00
Iron Car Axles.....	21.00 to 21.50
Steel Car Axles.....	16.50 to 17.00
No. 1 Railroad Wrought.....	15.50 to 16.00
No. 2 Railroad Wrought.....	13.50 to 14.00
Shafting.....	16.50 to 17.00
No. 1 Dealers' Forge.....	13.00 to 13.50
No. 1 Bushing and Wrought Pipe.....	11.50 to 12.00
Iron Axle Turnings.....	11.25 to 11.75
Soft Steel Axle Turnings.....	10.50 to 11.00
Machine Shop Turnings.....	10.50 to 11.00
Cast Borings.....	5.00 to 5.25
Mixed Borings, &c.....	5.25 to 5.50
No. 1 Boilers, cut.....	11.00 to 11.50
No. 2 Boilers, cut.....	9.50 to 10.00
Heavy Cast Scrap.....	11.25 to 11.75
Stove Plate and Light Cast Scrap.....	8.50 to 9.00
Railroad Malleable.....	12.00 to 12.50
Agricultural Malleable.....	11.00 to 11.50

Metals.—There is a feeling of somewhat greater confidence among buyers of Copper, who are induced also to enter into the future a little more freely by the difficulty of getting prompt shipments. Prices are quite firm. Carloads lots of Lake are held at 17c., and Casting brands at 16½c. Pig Lead stands steadily at 4.32½c. for Desilverized and 4.42½c. for Corroding, in 50-ton lots.

Dealers continue to quote selling prices on small lots of Old Metals as follows: Copper Wire and Heavy, 15c. to 15½c.; Copper Bottoms, 14c.; Pipe Lead, 4.15c.; Zinc, 2.75c.

Coke.—There is no improvement in the supply of well-known Cokes, and spot deliveries continue to command premiums. Strong pressure has been brought against the carriers to induce better transportation to this market, but without appreciable effect. Some cheap Coke products, however, are in fair supply. Connellsville Foundry Coke is selling at \$4.25 to \$5 for future shipments, with some transactions 25c. higher for quick shipment.

Philadelphia.

FORREST BUILDING, November 12, 1901.

The situation in the Iron and Steel trade is almost, if not entirely, unprecedented. There has never been a time when consumption was as large as it is to-day, and, although it is more than three years since the movement began, there has been no appreciable backset during the entire period, and if appearances can be depended upon a new and aggressive campaign is not improbable in the near future. There is plenty of material for plausible theories on both sides of the question, but we are confronted with conditions which are liable to make theories look very sick before we are through with them. It should not be understood that this article undertakes to define any distinct position as being absolutely the one which will be the first to assume shape, although for the time being it is not a question of diminishing business or declining prices, but rather what is going to be done with all the business that is coming in, and are prices likely to be higher and how much higher? Some people think that we are on the verge of a semi-panic on account of the difficulty of getting deliveries. Coal and coke cannot be had because of the scarcity of cars, and this places an embargo on Pig Iron production, as well as on the various kinds of Finished Material. Stocks of Pig Iron are the smallest on record, considering the tonnage required for daily consumption, yet instead of seeing relief within measurable distance the indications are that things will be worse before they are better. If bad weather should set in so as to interrupt transportation the situation would be additionally aggravated, and at this time of year there is always a possibility of blockades, which would still further emphasize the car shortage. Ordinarily such matters would attract but slight attention, but as things are to-day it is causing serious uneasiness. This, of course, is only one phase of the situation; others might be mentioned in detail, but for the present this is the one that predominates. The course of events during the past week has been favorable to higher prices for Pig Iron, but in the more advanced products there has been no distinct change, although once in a while there are whispers of a falling off in the demand for Plates and Bars, and a possibility of orders being pretty well exhausted by the end of the year. Nevertheless, consumers are doing so much work that owners of mills are not much afraid of any permanent shrinkage in the demand, and, moreover, the "community of interests" system prevents undue anxiety on that point, as it is practically "share and share alike." The closing months of the year, however, are showing a degree of buoyancy in business circles that is most remarkable, considering the long stretch of activity which we have had and the gloom and despondency which have developed in other countries.

Pig Iron.—It is an easy matter to define the present condition of the market, but it is by no means easy to say what it is likely to be three months hence. For the time being sellers have everything their own way, and it is surprising how little disposed they are to take advantage of what may after all be merely a temporary condition. The furnace that can make fairly prompt shipments is in an enviable position, however, but they are all doing their best to accommodate their customers, so that as yet no one has had to shut down for want of material, but there are a great many cases in which it is

a day to day fight to keep up the supplies. Prices, of course, are very firm, probably 25c. higher for this year's shipments, but a great many large buyers are making contracts for the first three and the first six months of 1902, prices in such cases being at the old figures, the advance, such as it is, being for shipments during 1901. In some grades of Iron very notable advances have been made, a difference of \$2 to \$3 per ton being noticeable between last week's sales and those made during the early summer months. Foundry Irons, however, have not scored any material gains, 75c. per ton, or possibly \$1 in some cases, but it has been a slow process and has required several months in which to make the full advance. Mill Irons are a little better, sales having been rather heavy at about \$14, delivered, for good standard brands. Foundry (No. 2 X) may be picked up at about \$15.25 occasionally, but \$15.50 is a more general price, some quoting \$15.75 firm. The advance is most marked in Irons for Steel making, the demand being very heavy both for Bessemer and Low Phosphorus grades. Fair average prices would be about as follows for Philadelphia and nearby deliveries, and about 25c. less for deliveries within a radius of 100 miles south or west: No. 1 X Foundry, \$15.75 to \$16; No. 2 X Foundry, \$15.25 to \$15.75; No. 2 Plain, \$14.75 to \$15; Standard Gray Forge, \$13.75 to \$14; Ordinary Gray Forge, \$13.50; Basic (Chilled), about \$14.25, and Bessemer at \$15.50 to \$15.75.

Billets.—Conditions remain about the same as for several weeks past. There is great scarcity, and under the necessity for prompt deliveries, \$29 and upward would have to be paid. For deferred shipments prices vary according to circumstances, but very much lower figures are quoted to first-class buyers for deliveries covering the first six months of the coming year. German Sheet Bars are being brought in for December delivery, at about \$29 ex ship, this port.

Plates.—There is only a moderate demand for Plates, but there is enough work in hand and in prospect to make it reasonably certain that there will be pretty full employment during the winter months. The capacity for production is steadily increasing, however, so that what would have overtaxed the mills earlier in the year would be somewhat "short commons" at the present time. The easier conditions are, therefore, due more to increased production than to decreased consumption, but the pool arrangement keeps prices steady, so that in this respect no change is likely to be made in the near future. Quotations therefore remain as follows for Philadelphia and nearby deliveries: Universals, 1.75c. to 1.80c.; Sheared, 1.75c. to 1.80c.; Flange, 1.85c. to 1.95c.; Fire Box, 1.95c. to 2.05c.; Marine, 1.95c. to 2.05c.

Structural Material.—In this department there is no change and no probability of change for a long time to come, as the mills are greatly overloaded with orders, besides others waiting their turn for acceptance. Prices nominally as follows for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—The tone of the market is a little quiet, although inquiries are on the market for large lots from car builders. There seems to be no urgency, however, and mills are in a position to accept a good deal of new business, but owing to the selling agreement prices are firmly maintained, with sales at 1.65c. to 1.70c. for Iron Bars and 1.62½c. to 1.65c. for Steel Bars, for car-load lots, as a minimum.

Sheets.—There is no abatement in the demand for Sheets, and so far as this market is concerned, everything appears to be completely cleaned up. It is difficult to quote exact prices under such conditions, but the following is as near as can be given for Best Sheets (Common Sheets two-tenths less): No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.70c. to 2.80c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.75c. to 3.90c.; No. 28, 4.25c. to 4.40c.

Old Material.—There is a very active demand, and although prices are irregular, they are, as a rule, quite strong. Bids and offers for deliveries in buyers' yards

are as follows: Choice Railroad Scrap, \$19.50 to \$20.50; Country Scrap, \$16 to \$17; No. 2 Light (Ordinary), \$12.50 to \$12.75; No. 2 Light (Forge), \$13.75 to \$14.50; Machinery Cast, \$14 to \$14.50; Heavy Steel, \$17 to \$17.50; Old Steel Rails, \$17 to \$17.50; Old Iron Rails, \$21 to \$21.50; Wrought Turnings, \$12 to \$12.50; Cast Borings, \$7.75 to \$8; Old Car Wheels, sales at about \$16.50; Iron Axles, \$23.50 to \$24; Steel Axles, \$19 to \$20.

Cleveland.

CLEVELAND, OHIO, November 12, 1901.

Iron Ore.—During the last week the rates on Ore have been stronger than at any time this season, and another advance has been recorded from the head of the lakes. Some contracts have been closed on the basis of \$1.25 from Duluth to Ohio, and of \$1.15 from Marquette to the lower lake ports. While nothing has been done out of Escanaba it is reasonable to suppose that a better rate will be demanded. The vessel owners are refusing to place any boats for less than 80c. The amount of Ore to be brought down the lakes by wild boats is by no means large now, and it is expected that the movement will be comparatively light from this on. The expectation, therefore, is that rates will prove to be stable during the remainder of the season. The report has been compiled, showing the movement of Iron Ore during the month of October. The upper lake ports shipped 2,986,468 tons, an increase over the same month the previous year of 583,581 tons. The movement to November 1, 1901, was 18,143,573 tons, an increase over the same period for the preceding year of 855,621 tons. The total movement was a complete surprise to the marine interests, in that it indicates very clearly that the year's movement will aggregate upward of 20,000,000 tons, whereas it has been expected that the 19,000,000-ton mark would be hardly passed.

Pig Iron.—With many of the furnaces in the Valleys blowing out because of a lack of Coke, the market is getting stronger, and the strength is shown in prices. This week it has become generally spread abroad that \$14.50 in the Valley is the best that can be done on No. 2 Foundry, and the sales are not very brisk at that. All of the material has been sold up for the remainder of the year, and now the sales are reaching well over into next year, making allowance for deliveries up to June 1. The supply of material for the present is very short, and even if it were more plentiful the furnacemen would be unable to move it because of the lack of railroad equipment, including cars and motive power. In places through Ohio also the business is so large that it is not a question of equipment, but of track space for the movement of the trains already made up. This is causing very poor dispatch to all of the furnaces. Incidentally also it is robbing the furnaces of their supply of Coke, and this week several more furnaces have gone out of blast. Many will take this occasion to make needed repairs. It is estimated by the Pig Iron men that before the end of the season of navigation, when some relief is looked for in the car situation, all of the furnaces will have been out of blast for a greater or less length of time. Some of the Basic furnaces having gone out of blast, the supply of material, which was none too good at the outset, has been greatly diminished, and now the prospects for prompt delivery are not very bright. The price has stiffened a great deal, and \$15 in the Valley is the best that may be done. All of the available material has been sold up to January 1. Bessemer Iron is creating little discussion other than upon the absence of sales for next year. The larger buyers are holding off, and the market remains steady at \$15.25 in the Valley, which, however, is a nominal figure.

Finished Material.—In an effort to readjust the basis of prices Bar Iron has been reduced \$1 during the last week. The new quotation is the same as Bessemer Bar Steel, or 1.50c., Pittsburgh. This is brought about by a desire to equalize affairs since the change of base from Youngstown to Pittsburgh. It hardly, therefore, represents a price weakness in the market, although it is confessed that the possibilities of obtaining prompt deliveries on orders for Bars are brighter than on other

finished products. This is but natural, however, since it has become known that the new Carnegie mill at Duquesne has a producing capacity of 400 tons daily. Bar Steel still brings 1.50c., Pittsburgh, for Bessemer, and 1.60c., Pittsburgh, for Open Hearth. Rails are as strong as ever, and the bidding this week has been quite heavy. Sales of about 10,000 tons have been made recently to local concerns, and following this an inquiry came from a Southwestern line for 8000 tons of Rails to be shipped early next year. Cleveland parties are interested in this order and made the bid. The price is unaltered at \$28. The Structural market showed a change this week that was somewhat surprising. The information that deliveries on orders for Angles are impossible until after January 1 brought out half a dozen contracts of good size which require deliveries up to April 1 next year. The winter market, therefore, is extraordinarily strong, and the consumers begin to figure future capacity by the winter sales, and have decided to buy now. The prices hold at 1.70c. Angles are about off of the market, but better than January 1 may be done on deliveries on Beams and Channels. Sheared Plates are sharing the great activity in all lines of the trade, and it is now apparent that the sales are coming in in excess of production. The outlook in ship and car material is extraordinarily bright, especially so since the lake yards have taken new boat orders, and it is known that others are pending and will be placed as soon as berth space is obtainable. Sheets are selling well, with prices holding firm and with but little material available for shipment. Billets and Sheet Bars are entirely off of the market, and some of the larger mills are not even offering to afford such when a big premium is paid. It has passed beyond the question of price now. The last nominal quotation was \$28 for the larger sizes.

Old Iron.—The Scrap trade this week has been a little dull, and the dealers are looking around for orders. Some of the sales agents have reported that Cast Scrap is in no demand whatever, and the other grades are weak. The prices have not changed greatly. The market is represented by the following: No. 1 Wrought, \$16.50 net; Cast Borings, \$8 gross; Wrought Turnings, \$12.25 gross; Cast Scrap, \$13 net; Stove Plate, \$10 net; Heavy Steel, \$17 gross; Steel Rails, \$17 gross; Old Iron Rails, \$22 gross; Old Steel Axles, \$19 gross; Old Car Wheels, \$17 gross.

Cincinnati.

FIFTH AND MAIN STS., November 13, 1901.—(By Telegraph.)

While the aggregate of Pig Iron orders for the past week may hardly be as large as for the weeks preceding, yet there has been a very satisfactory trade and the favorable conditions have been fully continued. Large orders have been scarcer, but in numbers they have shown perhaps an increase. The business is remarkably well distributed, both as to class of buyers and as to territory. A large portion of the buying is for the second quarter of next year, and for any sooner delivery there is a decided scarcity of many grades. This is especially so in regard to Mill grades and No. 4 Foundry, which are pretty well cleaned up, and on that account are at a premium over the rest of the price-list. There is a very heavy complaint on account of the lack of cars, and both in Pig Iron and Coke circles the grievance is severe. The outlook is for a good steady market for some time yet. Freight from Birmingham is \$2.75 to this point; from Hanging Rock district \$1.10. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	to \$14.25
Southern Coke, No. 2.....	to 13.75
Southern Coke, No. 3.....	to 13.25
Southern Coke, No. 4.....	\$12.75 to 13.00
Southern Coke, No. 1 Soft.....	to 14.25
Southern Coke, No. 2 Soft.....	to 13.75
Southern Coke, Gray Forge.....	12.75 to 13.00
Southern Coke, Mottled.....	12.75 to 13.00
Ohio Silvery, No. 1.....	15.35 to 15.85
Ohio Silvery, No. 2.....	14.85 to 15.35
Lake Superior Coke, No. 1.....	15.35 to 15.85
Lake Superior Coke, No. 2.....	14.85 to 15.35
Lake Superior Coke, No. 3.....	14.35 to 14.85
Southern Basic.....	to 14.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades.....	\$18.25 to \$18.75
Standard Southern Car Wheel, No. 2.....	17.25 to 17.75
Lake Superior Car Wheel and Malleable.....	18.50 to 19.00

Plates and Bars.—The market is quieter though still quite firm. Iron Bars have been placed on the same basis as Steel Bars and are quoted f.o.b. Cincinnati as follows: Iron Bars in carload lots, 1.60c. to 1.65c., with half extras; same in small lots, 1.65c. to 1.80c., with full extras. Steel Bars are same price as Iron Bars. Base Angles, in carload lots, 1.90c.; Plates, ¼-inch and heavier, 1.90c. to 2c.; 3-16 inch, 2.10c.; Sheets, No. 16, 2.90c. to 3c.

Old Material.—The market is in a good healthy condition, with no material change in prices. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, \$14 to \$14.75; Cast Railroad and Machine Scrap, \$12.25 to \$12.75; Iron Axles, \$19 to \$20; Iron Rails, \$17.25 to \$18.25; Steel Rails, rolling mill lengths, \$14.75 to \$15.25; short lengths, \$13.75 to \$14; Car Wheels, \$16 to \$17. All prices except No. 1 Wrought on the basis of gross tons.

Pittsburgh.

HAMILTON BUILDING, November 13, 1901.—(By Telegraph.)

Pig Iron.—There is a heavy demand for Forge Iron, a leading consumer being in the market for a round tonnage for the first quarter. We can note sales of 8000 to 10,000 tons of Forge on the basis of \$13.75, at Valley furnace, equal to \$14.50, Pittsburgh. Very little of this iron, however, comes to this district. We also note a heavy demand for Foundry Iron, and it is scarce for prompt delivery. Several leading consumers of Foundry have bought heavily for delivery clear through next year on the basis of about \$15.25, Pittsburgh, for No. 2. There is a fair tonnage moving in Bessemer Iron, but mostly in small lots. The market is \$15.25, at Valley furnace, minimum, and from 10c. up to 25c. a ton premium has been paid for prompt Iron. The scarcity of Coke, caused by the car shortage, is still interfering with operations, and at this writing two or three of the Valley furnaces being banked. We quote: Bessemer Iron, \$15.25, at Valley furnace in large lots, and \$15.35 to \$15.50 in small lots for prompt shipment. Forge Iron is firm at \$13.75, Valley, or \$14.50, Pittsburgh, for Northern brands. Southern Forge is firm at \$10.25 at furnace, equal to \$14.40, Pittsburgh, and we note a sale of 500 tons at that price. We quote No. 1 Foundry Iron at \$15.75 to \$16, and No. 2, \$15.25 to \$15.50, Pittsburgh. We note sales of 3000 to 5000 tons of No. 2 Foundry Iron at \$15.25 to \$15.35, Pittsburgh, and for delivery through next year.

Billets.—Prompt Steel continues scarce, and readily brings from \$27 to \$28 at maker's mill. There is some inquiry for Steel for next year's shipment, but views of buyer and seller as to prices are so far apart that little has been done.

Rails.—It is stated that practically the entire output of Rails of the constituent companies of the United States Steel Company are under contract for next year.

(By Mail.)

Taken as a whole the Iron trade may be said to be in a very satisfactory condition. The mills are well filled up, prices are very profitable and the outlook is that there will be plenty of work through the winter months. A fact that should not be lost sight of is that a great deal of new capacity in Sheets, Tubes, Tin Plate, Wire and Nails, and, in fact, in nearly all kinds of Finished Material, is coming on the market, and this is bound to make itself felt before a great while. The fact that we have almost dropped export trade in Iron and Steel is also an important feature of the situation, and time alone will demonstrate whether domestic consump-

tion is large enough to take the enormous output of our furnaces and mills. The condition of trade in Europe is bad, prices are low, and occasionally a stray lot of material finds its way from abroad into this country. A large consumer of Sheets has recently made some imports, and it is said more is on the way. The feature of the Pig Iron market is the heavy demand for Forge, a leading consumer being in the market for a round tonnage for shipment through the first half of 1902. The price has advanced sharply, and Forge is held at \$13.75, at Valley furnace, or \$14.50, Pittsburgh. There have been some good sized sales at this price. Bessemer Pig is quiet, and is selling only in small lots. Foundry is in very active demand and the market is firm. Prompt Steel is scarce, and brings \$27.50 to \$28, maker's mill. There is a fair demand for Finished Material, Plates having improved a little, but on some lines tonnage has fallen off slightly. About the only change in prices is a reduction of \$1 a ton on Iron Bars for shipment west of Pittsburgh.

Rails.—The Baltimore & Ohio order for 55,000 tons of Rails has been placed, 30,000 tons going to constituent companies of the United States Steel Corporation and 25,000 tons to Pennsylvania, Maryland and Cambria Steel companies. It is said the Rail mills have enough tonnage booked, together with what will be carried over into next year, to run them full up to October, 1902. We quote at \$28 at mill for Standard Sections.

Ferromanganese.—We quote foreign Ferro at \$50 a ton and domestic at \$52.50 to \$53.50, depending on the order. Not much domestic Ferro is being sold in this market, the output of the leading maker being taken by constituent interests.

Spelter.—We continue to quote Prime Western grades of Spelter at 4.15c. to 4.20c., delivered Pittsburgh.

Plates.—The Plate Association met last week, but only routine business was transacted. Tonnage in Plates is reported to be a little better, and the American Ship Building Company have placed some heavy contracts, most of the business going to the leading Plate interest. The report of a Plate combine, to include Jones & Laughlins, Limited, of this city, is incorrect. It is probable, however, that the Paxton Rolling Mills, Worth Brothers, Lukens Iron & Steel Company and Tide Water Steel Company, all in the Eastern part of the State, may consolidate. These mills are located pretty closely together, and would secure mutual advantages by consolidation. There is no trouble in getting prompt deliveries of Plates, shipments in some cases being made within two or three days after the order is placed. There is no change in prices, and we quote: Tank Plate, ¼-inch thick, up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.80c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, \$1 extra; gauges Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Muck Bar.—The market is firm, and we note sales of standard grades of Muck Bar at \$29.50, delivered buyer's mill, in this district.

Structural Material.—A good deal of tonnage continues to be placed, and the mills are well filled up, especially on heavy sections. A good many large jobs are being figured on and will be placed early in the new year, if not before. The 24-inch Beam mill of Jones & Laughlins is making some good records for output. It is not likely prices on Shapes will be changed for some time at least. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

Sheets.—On certain sizes of Sheets there is still some difficulty in getting prompt delivery, but as a rule the Sheet mills are making satisfactory deliveries. As an item of interest we may note that a large consumer of Sheets in this district has recently imported quite a tonnage from Belgium. The Sheets were not quite as nice looking as domestic, but as far as toughness is concerned, were just as good and met the requirements of the consumer. These Sheets were laid down at buyer's works at less than prices of domestic. Prices of Sheets in carloads are as follows: Nos. 10, 11 and 12, 2.40c.; Nos. 14 and 15, 2.50c.; Nos. 16 and 17, 2.60c.; Nos. 18 to 21 inclusive, 2.70c.; Nos. 22, 23 and 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.; No. 29, 3.25c.; No. 30, 3.35c. For small lots of a few bundles of Sheets and for prompt shipment No. 27 brings from 3.15c. to 3.25c., and No. 28, 3.25c. to 3.35c. We quote Galvanized Sheets at 70 and 5 off in carloads, maker's mill, and 70 off in small lots.

Rods.—There is more inquiry for Rods, and we quote at \$33, maker's mill.

Bars.—The mills have reduced the price of Iron Bars for shipment west of Pittsburgh, from 1.55c. to 1.50c., Pittsburgh. This was done to conciliate some of the Western mills. There is a fairly active demand for both Iron and Steel Bars, and where a mill can make prompt delivery from \$2 to \$3 a ton advance over regular prices can be obtained. Specifications from car builders have not been quite as heavy as usual. We quote Steel Bars at 1.50c. at mill, half extras, with \$2 a ton advance for open hearth stock and the usual advances for Special Shapes. We quote Iron Bars at 1.55c., Pittsburgh, for Eastern shipment, and 1.50c. for Western shipment.

Skelp.—There is only a fair inquiry, but some of the leading consumers of Skelp are expected to come into the market before long as buyers. We quote Grooved Steel Skelp at 1.75c., Grooved Iron Skelp at 1.80c. and Sheared at 1.85c., f.o.b. maker's mill, less 2 per cent. for cash in 30 days from date of shipment.

Tubular Goods.—The Tube market is in very satisfactory condition, demand being good, especially for Boiler Tubes, while present prices are very profitable. There is little trouble now in getting prompt deliveries of Pipe; in fact, prices of jobbers are lower than for some time. To consumers in carloads, prices are as follows:

Merchant Pipe.		
	Per cent. Black.	Per cent. Galvd.
¾ to 1½ inch and 11 to 12 inch.....	61	48
¾ to 10 inch.....	68½	56
Casing, Random Lengths.		
	S. & S.	I. J.
2 to 3 inch.....	58	53½
3¼ to 4 inch.....	63	59
4¼ to 12½ inch.....	65	61½
Casing, Cut Lengths.		
	S. & S.	I. J.
2 to 3 inch.....	53½	59
3¼ to 4 inch.....	59	55
4¼ to 12½ inch.....	61½	57½
Boiler Tubes.		
	Up to 22 feet. Per cent.	
Steel.		
1 inch to 1¾ inch and 2½ inch to 5 inch, inclusive....	65½	
2 inch to 2½ inch, inclusive.....	60	
6 inch and larger.....	59	
Iron.		
1 inch to 1¾ inch and 2½ inch.....	43½	
1¾ to 2½ inch.....	43	
2½ inch to 13 inch.....	53	

To the jobbing trade the mills quote slightly lower prices than are given above.

Connellsville Coke.—The supply of cars in the Connellsville region has not yet shown much improvement, but will probably soon be better, as navigation will close about November 15, when a large number of cars now used in hauling Ore and Coal will be returned to the Coke trade. It is not likely there will again be such a shortage of cars in the Coke trade for a long time, as the order for 13,000 cars recently placed by the Pennsylvania Railroad ought to relieve the situation very much. Some of these cars will be available by the time navigation opens up again in the spring. Taking advantage of the scarcity of Connellsville Coke, the producers of West Virginia Coke have advanced prices from 25c. to 30c. a ton. At some of the works in the Connellsville region there is a scarcity of water, and unless there are soon heavy rains there will be trouble from this source. The output of Coke last week in the Connellsville region

was 233,720 tons, 19,830 ovens being active and 2003 idle; shipments were 10,896 cars. Prices of Coke are very firm and for prompt shipment slight premiums are being paid. We quote strictly Connellsville Coke at \$1.85 to \$2 and Foundry from \$2.25 to \$2.50 a ton. Most of the Foundry Coke is being sold at the latter price. We quote Main Line Furnace Coke at \$1.65 to \$1.75 and Foundry at \$1.85 to \$2, all in net tons, f.o.b. at oven.

Iron and Steel Scrap.—The feature of the Scrap market is the large demand for Heavy Melting Stock, which has advanced very materially in price and which we quote at \$18 and \$19 a ton. We quote No. 1 Railroad Wrought Scrap at \$16.50 to \$17 net ton and Cast Scrap at \$12 gross ton. We quote Cast Iron Borings at \$7 gross ton and Low Phosphorus Melting Stock at \$19 to \$20 gross ton. Old Iron Rails are held at \$21.50 to \$22. at Valley mill.

John Eichleay, Jr., has removed from 1000 Brownsville avenue to South Twenty-second and Wharton streets, South Side, Pittsburgh, where he will carry on his established business of house moving and Steel Structural Material. Mr. Eichleay is prepared to furnish Beams, Channels, Angels, Tees, Zees, Plates, Bars, Cast and Steel Columns promptly and in all sizes cut to any length.

J. K. Dimmick & Co., Pig Iron, Steel and Coke, 1051-1053 Drexel Building, Philadelphia, have opened offices in room 513, Fitzsimmons Building, Pittsburgh, with George S. Griscom, Jr., in charge. Mr. Griscom is well-known in the Iron trade in the Central West, and will no doubt be able to secure plenty of business for his firm.

The offices of the National Tube Company will be removed from Conestoga Building and Empire Building to the Frick Building, Fifth avenue, Pittsburgh, when the latter structure is completed, about April 1, 1902.

The offices of the Union Steel Company will be removed from the Empire Building to the Frick Building about April 1 next.

Birmingham.

BIRMINGHAM, ALA., November 11, 1901.

The Iron market has been reported previously as having a hardening tendency. That was true, and is true now. In the case of Gray Forge the price has been advanced, in some cases, to \$10, and it has been obtained. But the transactions have been limited to, practically, retail lots. Some No. 1 Soft has sold at \$12, and No. 2 Soft at \$11. No. 1 Foundry went at \$12, and No. 2 Foundry at \$11. No. 3 Foundry sold at \$10.50, and there is a feeling that this price ought to be \$10.75, and the price for No. 4 Foundry should be \$10.25. If an advance to these figures should occur this week, which is likely, the local market would be benefited to a very small extent, owing to paucity of stocks. The two leading interests informed your correspondent that the acceptance of new business this side of January was out of the question with them, and that their efforts were directed mainly to delivery of sales already made. Shipments are showing a slow improvement in volume, but the supply of cars is yet far below shippers' demands. All of them are yet materially behind in delivery. The cry for prompt shipment on the part of buyers still continues, but the sellers can do nothing but feel sorry. The rolling mill interests have been backward in taking their requirements, and are coming in now for such amounts to cover necessities. This helps to give a firm market. Sales for delivery the first quarter of 1902 approximate the anticipated output, while they have been freely sprinkled over the second quarter.

For Steel there has been a steady good demand, and the Steel mill has had more business offered it than it could care for. Transactions have been at an advance of \$1 per ton, but actual figures on transactions are withheld. The Rail mill is in *statu quo*. The time fixed for it to go in commission has arrived. Until we get to making more Steel the Rail mill probably will be an enterprise in anticipation.

The Southern Car & Foundry Company, whose site is at Wylam, adjoining Ensley, are at work with a full

working force, grading, &c., preparatory to the erection of the new plant. The Alabama Steel & Wire Company (the Bar and Rod mill) are running to full capacity, and working double shift to keep in sight of orders. The Plow works has largely increased capacity, only to find that demand for their output continues to infringe on capacity.

In the manufacture of Corliss Engines, Boilers, Tanks, Pipe, Stacks and miscellaneous work, our various shops are busily occupied, with the larger and more important of them running double shifts. The increase in these lines of business has been very perceptible, and it is constantly growing. The order books show business from the Atlantic to the Pacific oceans, and from the lakes to the gulf. As expressed by the manager of one important shop, "business we have not sought has come and continues to come to us from all quarters, and some of it from great distances." In fact, we see nothing ahead of us but encouragement.

The contract for the erection of the ten-story office building, of which frequent mention has been made, was signed the past week. The successful competitors were a Chicago firm, and work will begin without delay. On top of this gossip is free concerning an eight-story fire proof hotel, to materialize at an early date. Projects and plans for all sorts of things are in vogue, showing the abundance of money seeking investment. The Pittsburgh people who bought the coal properties in Walker County of the Corona Coal Company are active in the development of their holdings, and propose to increase the normal output of 400,000 to 1,000,000 tons. The wagers of the miners has been increased $2\frac{1}{2}$ ¢. per ton to correspond with the increased price (over September) in Iron. Railroad development and betterment continues active, and we will soon be the hub of the wheel in which railroads pointing in all directions will be the spokes. Progress—progress—onward and upward—has its home in this district now.

St. Louis.

CHEMICAL BUILDING, November 13, 1901.—(By Telegraph.)

Pig Iron.—A canvass among the leading interests in the Pig Iron market in this section reveals no change in the conditions which have been ruling of late. Orders of 300 and 500 tons seem to be about the maximum of single lots, but the aggregate tonnage of these and smaller requirements keeps the order book in most satisfactory shape. We have put our quotations up 25¢. all through the list, not in the sense of an advance by the furnaces, but as better reflecting conditions of the market at this center. Sales of low grade Iron at furnace to clear up stock are heard of, but no cars are at the disposal of the sellers for transportation. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry.....	\$15.00 to \$15.25
Southern, No. 2 Foundry.....	14.25 to 14.50
Southern, No. 3 Foundry.....	13.75 to 14.00
Southern, No. 4 Foundry.....	13.25 to 13.50
No. 1 Soft.....	14.75 to 15.00
No. 2 Soft.....	14.25 to 14.75
Gray Forge.....	13.25 to 13.50

Bars.—Buyers' requirements are still heavy and urgent for Iron and Steel Bars, and the market keeps an active and strong tone thereby. Most hopeful views for the future outlook seem to be entertained by the trade. We quote Iron Bars at 1.70¢. to 1.80¢.; Steel Bars at 2¢. Jobbers quote Iron Bars at 2¢. to 2.10¢.; Steel at 2.10¢. to 2.15¢., full extras.

Rails and Track Supplies.—The Rail department of the market is without new features and great activity of demand is the ruling factor. There is still a strong call for Track Supplies and conditions prevailing are very satisfactory to the trade. We quote: Splice Bars, 1.75¢. to 1.95¢.; Bolts, with Square Nuts, 2.75¢. to 2.90¢.; with Hexagon Nuts, 2.90¢. to 2.95¢.; Spikes, 2¢. to $2\frac{1}{2}$ ¢.

Pig Lead.—No new features can be cited in the Pig Lead market and a fair demand is ruling, with no change to be noted in prices. Soft Missouri at 4.25¢. to 4.27 $\frac{1}{2}$ ¢., and Chemical at 4.30¢. to 4.35¢.

Spelter.—A very satisfactory volume of sales can be noted in the Spelter market, but no large transactions

can be singled out commanding special attention. Prices rule around recent level with firm tendency, and 4.12¢. is bid.

Sheets.—The conditions prevailing in the market for all classes and sizes of Sheets are felt to be satisfactory, and jobbers quote $\frac{1}{4}$ -inch and heavier at 2.10¢. to 2.20¢. Stove Pipe size of No. 27 at 3.45¢. to 3.50¢. Galvanized Sheets 65 and 5 off, and in round lots 70 off is quoted.

Angles and Channels.—The demand and inquiry for small Angles and Channels is considered good and jobbers' prices are named at 2.30¢., base, for both classes of materials.

The Belgian Iron Market.

BRUSSELS, October 18, 1901.

It is with satisfaction that we can report a more favorable turn in the situation of the Belgian Iron and Steel market. The numerous efforts, however, made by the ironmasters to bring about an advance in prices, even a slight one, have been made in vain.

Belgium is, above all, an exporting country, and its prosperity or depression depends principally on the condition of the international market. Proposals and orders from England are proofs of the persistent improvement of business in that country; prices there are firmly maintained, and in certain cases show a pronounced rising tendency. It should, therefore, be very good for us who have been so long influenced by the example of our English neighbors. But, unfortunately conditions have changed of late, and we are to-day under the influence of Germany, whose actual situation is so precarious. Want of confidence predominates everywhere; the home market is in a gloomy condition, and we naturally fall back on exportation in order to keep our mills active. Germany does not only fight us in the world's market, but even comes to Belgium to supply us with Steel and sundries. Our own market, naturally, suffers a great deal by this competition. Although the symptoms of revival should bring back confidence business is far from having returned to its normal condition.

The demand for Iron is weak, and offers are plentiful, and hence the tendency of prices has for some time been a downward one. Following are prices of grades of Iron generally used, which have been obtained in September, 1901, and October, 1901, against October, 1900:

	October 15, 1901.	September 15, 1901.	October 15, 1900.
	France.	France.	France.
No. 3 Luxemburg Foundry Iron.....	56	58	95
Luxemburg Mill Iron.....	48	49	80
Charleroi Mill Iron.....	52	53	85
Basic Pig.....	65	65	100

Within a month the price of Luxemburg Foundry Iron has dropped 2 francs per ton; mill Iron, 1 franc, and Basic Pig, 2 francs.

The time has not yet come to allow the blast furnaces to start up again, as the price of Coke, held at 17 francs by the syndicate, is considered much too high in comparison with the prices at which Iron is sold.

The number of blast furnaces in existence in Belgium is 39, but only 25 are in blast. In Luxemburg, out of six, only five are active, and in Liège 12 out of 17.

None of the Iron producing works of the Charleroi region have more than one furnace working; the quantities produced being for their own needs. Out of 16 blast furnaces but eight are active; hence just one-half are idle—a state of affairs which never occurred before.

Following is a list of exportations and importations for the first nine months of the years 1900 and 1901:

	Imports.	
	First nine months 1901. Tons.	First nine months 1900. Tons.
Pig Iron.....	117,439	256,282
Castings.....	6,978	3,250
Totals.....	124,417	259,532
	Exports.	
	First nine months 1901. Tons.	First nine months 1900. Tons.
Pig Iron.....	10,172	6,224
Castings.....	18,981	19,805
Totals.....	29,153	26,029

A rather marked falling off in importation is shown, amounting to 135,115 tons, against a slight increase of 3124 tons for exportation.

Concerning Old Iron, importations amounted to 30,000 tons during the first nine months of 1901, against 53,600 tons during the same period of 1900. Exportations have been respectively 21,850 tons in 1901, against 34,447 tons in 1900.

Partially manufactured products, such as Steel Ingots, Blooms and Billets and Loops, we buy principally abroad, mostly from Germany and France, in order to transform them into finished goods, which are subsequently exported. Our importations of such products are on the increase, while our exportations are decreasing, as will be seen from the following table:

	First nine months 1901. Tons.	First nine months 1900. Tons.
Importations	56,202	10,350
Exportations	563	1,679

Prices generally obtained are: Old Iron, 62 to 65 francs; Ingots, 87 francs; Blooms, 93 francs.

Transactions in finished products are principally in Iron Bars and Plates. For the former the demand for export is very brisk, and the order books are well filled for some time to come. They sell at present at from £5 16s. to £5 8s. for export, and 13.50 to 13.75 francs for home use. Both fine and medium Plates are in good demand. The naval yards are very busy, and in consequence the Plate makers have abundant orders on hand. Iron Plates No. 2 are quoted at 145 francs for home use; No. 3 at 150 francs; Thomas Steel Plates at the same price, and fine Sheets at 160 francs. For export Iron sells for £5 13s., and Steel for £5 17s.

The export market for Beams is practically dead owing to German competition. Our imports, which during the first nine months of 1900 were 1396 tons, have increased to 8729 tons during the same period of time for 1901, and our exports have decreased from 70,025 tons in 1900 to 16,550 tons in 1901.

Finished products, in general, have suffered the same fate, but in a much less degree, as the following table will show:

Imports of Finished Products.

	First nine months 1901. Tons.	First nine months 1900. Tons.
Iron and Steel Wire.....	27,231	18,716
Beams	8,729	1,396
Rails	882	739
Plates and Sheets.....	8,192	11,833
Rolled Iron and Steel.....	17,067	24,039
Nails	549	513
Shapes	10,853	6,323
Galvanized Iron.....	78	203
Tin Plate.....	3,030	3,621
Totals.....	207,330	390,841

Exports of Finished Products.

	First nine months 1901. Tons.	First nine months 1900. Tons.
Iron and Steel Wire.....	5,076	4,653
Beams	16,553	70,025
Plates and Sheets.....	84,829	42,013
Rails	47,811	119,790
Rolled Iron and Steel.....	150,136	142,315
Nails	11,702	9,883
Shapes	48,943	55,877
Galvanized Iron.....	2,324	2,197
Tin Plate.....	289	636
Totals.....	419,229	447,389

Exportation, in consequence, is on the decrease, being less by 17,572 tons, or 4 per cent., and importation on the increase to the amount of 9248 tons, or 13½ per cent.

If we now pass in review the condition of our construction shops we will notice the situation not to be quite as bad, thanks to recent contracts received from the Belgian State railroads. The contracts for locomotives and boilers which have been placed in September last with Belgian constructors amount to about 11,000,000 francs (\$2,222,000).

Of the contracts for freight cars and passengers cars for the State and for the Société Nationale several lots have been secured by foreign competitors (Germans and

Hungarians), which has naturally displeased the Belgian constructors.

Strange to say, American locomotives (whatever the English may think of them), remarkable for their efficiency and the excellence of details, did not come to compete for these important contracts. It appears to us that Americans are perfectly able to come and compete in Belgium with the Germans. Do you not easily beat them at our very door, for instance, in Holland?

Instead of an increase in our importations from America we note a decided decrease, as the table given below will demonstrate:

	First nine months 1901. Tons.	First nine months 1900. Tons.
Crude Iron.....	1,906	9,187
Old Iron.....	873	1,311
Foundry Iron.....	51	31
Wrought Iron.....	31	58
Iron and Steel manufactures...	81	450
Steel Wire.....	4	757
Galvanized Iron.....	...	2
Total, tons.....	2,946	11,796

These figures show that the decrease has been a considerable one. In 1900 the United States contributed but 3.01 per cent. of the total of our Iron and Steel imports, which in itself is but an insignificant share. In 1901, again, they amounted to but 1.02 per cent., which is really next to nothing.

The same may be said of machinery and tools. In fact, the United States furnished but 1735 tons in 1901, against 3424 in 1900, which amounts to a reduction of one-half. For these articles your share in our total imports was 8.78 per cent., and to-day it amounts to but 5.54 per cent.

New York.

NEW YORK, November 13, 1901.

Pig Iron.—Trade is quite as active as furnace companies care to have it under existing circumstances. The demand is heaviest for grades which are in short supply and on which makers have their product under contract far into the future. The leading companies report their sales still running in excess of their current output. Southern Gray Forge has been marked up 50c. We quote: No. 1, \$16 to \$17.50; No. 2 X, \$15.15 to \$15.75; No. 2 Plain, \$14.65 to \$15; Gray Forge, \$14 to \$14.50; Tennessee and Alabama brands, No. 1 Foundry, \$15.50 to \$15.75; No. 2 Foundry, \$14.75 to \$15; No. 1 Soft, \$15.50 to \$15.75; No. 2 Soft, \$14.75 to \$15; No. 3 Foundry, \$13.75 to \$14; No. 4 Foundry, \$13.50 to \$13.75; Gray Forge, \$13.75 to \$14.

Cast Iron Pipe.—Numerous inquiries are being received for next year. The outlook has perhaps never been more promising. It is not yet known what company will receive the contract for the Pipe to be furnished the city of New York. Quotations are continued at \$26 to \$27, gross ton, tidewater.

Steel Rails.—Eastern mills are in continued receipt of orders for next year's delivery. The Pennsylvania Steel Company secured a share of the large contract placed by the Baltimore & Ohio. Standard Sections are unchanged at \$28, Eastern mill.

Finished Iron and Steel.—Structural material is in strong demand, with a heavy tonnage in sight for next year. The past week the American Bridge Company closed a contract for the Atlantic avenue improvement of the Long Island Railroad in Brooklyn, taking 17,000 tons. They also finally closed the contract previously referred to with the Union Pacific for bridge work aggregating 20,000 tons. The same company were successful bidders for the Wabash Bridge, at Pittsburgh, taking 7000 tons. They have further secured a contract for the erection of buildings for a new steel plant to be built in Western Pennsylvania by an English company. The steel for the superstructure of the new custom house in this city, about 4500 tons, will soon be under contract, as bids for the work have been opened. A heavy pressure is noted for Angles, Eastern mills receiving orders for shipment to the West on which buyers are willing to pay a good premium. Prices are quoted as follows at

tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.80c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.60c. to 1.65c.; Soft Steel Bars, 1.62½c. to 1.65c.

Metal Market.

NEW YORK, November 13, 1901.

Pig Tin.—Until yesterday the market remained very uninteresting and practically unchanged. At the opening yesterday, however, there was a sharp advance, especially on spot and this month's delivery. The upward movement raised prices fully ¾c. per lb. The sudden turn was said to be due to an effort to cover certain short interests in deliveries up to the 15th of this month. As stocks on the first of this month were only moderate and arrivals so far this month amounted to only 435 tons, a squeeze for spot was not altogether unexpected. The market closed steady to-day, with spot quoted at 25.30c. to 25.50c. Futures were quoted as follows: November, 24¾c. to 25¼c.; December, 24.65c. to 25c.; January offered 24.50c., and February offered 24c. The London market closed at £112 10s. for spot and £168 for futures. These figures show a decline for spot and an advance on futures.

Copper.—While certain developments of the week had considerable sentimental effect on the market, there was no change as to actual business or prices. Quotations remain unchanged and consumers continue to buy only according to their immediate requirements. Both the United Metals Selling Company, who handle the Amalgamated product, and the American Smelting & Refining Company, have sent out a statement to their shippers notifying them that hereafter they will not settle on shipments of Copper Ore or Matte except upon the expiration of 90 days' time, and upon the prices of that date instead of the date of assay. Similar notices have been posted by other producers, but in following suit they made the time limit 60 days. This move is viewed in the trade as lack of confidence on the part of the producers in present prices. Another important feature of the market was the announcement of the reduction of the price of Copper Wire, from 18¾c. to 17c. This cut was made by the Waelark Copper Wire Company of Elizabethport, N. J., a manufacturing concern established and operated by Senator W. A. Clark, who is president and principal owner of the United Verde Copper Company of Arizona. It is still impossible to obtain spot Lake below 16.85c. to 17c. Electrolytic is unchanged at 16.30c. to 16¾c., and casting stock remains at 15¾c. to 16¾c., according to brand. In London the market has been firm and shows a slight advance over last week. Closing prices to-day are: Spot, £65 17s. 6d and Futures, £65. Best Selected is 5 shillings higher, with £72 15s.

Pig Lead.—Is unchanged, as to every viewpoint. There is a fair business in Soft Missouri, and in Desilverized business is slight. The American Smelting & Refining Company continue to quote 4.37½c. for Desilverized, f.o.b. New York and 4.32½c. St. Louis. London continues to show weakness with the price lower than it has been for some time: £11 3s. 9d.

Spelter.—The market here is very quiet. Prices named in this market range between 4.30c. and 4.35c. St. Louis quotes 4.12½c., and London is unchanged from last week with £16 12s. 6d.

Antimony.—Is unchanged. Hallett's is quoted 8¾c. Cookson's is unchanged, being held nominally at 10¼c. Outside brands declined to 8c. to 8¼c.

Nickel.—Is unchanged, prices continuing on a basis of 60c. for lots not covered by yearly contracts.

Quicksilver.—There is no change. The price is \$51 per flask of 76½ lbs., in lots of 50 flasks and more.

Tin Plates.—The situation is unchanged. The American Tin Plate Company are selling only for the first quar-

ter of next year on a basis of \$4.19 per box of standard 100-lb. Cokes, f.o.b. New York, and \$4, f.o.b. mills. London has declined 3 pence to 13 shillings 6 pence.

Iron and Industrial Stocks.

Throughout the entire week under review, until yesterday shortly before the close, the stock market showed a decided bullish tendency. Consequently the industrials advanced with the procession, some stocks gaining as much as two or three points. The interruption of the upward movement which came yesterday was the result of profit taking. On Wednesday morning the market opened strong, however, effecting a complete recovery. Transactions during the week were heavy. This was especially true in the instance of Pressed Steel, Republic Iron & Steel, Tennessee, American Car & Foundry and United States Steel.

A report to the effect that the United States Steel Corporation had acquired control of the Pressed Steel Car Company had a favorable effect on the stock of the latter company on Tuesday. When the report was denied on Wednesday no ill effect was felt, as it was generally believed in the street that the stock was still being acquired in the open market. The stock advanced two points on the strength of the reports. Tennessee Coal & Iron Company scored an advance of three points during the week.

The dividend of the United States Steel Corporation was paid, and the books show an increase of 25 per cent. in the number of stockholders of preferred since the payment of the last dividend.

Dividends.—The Lowell Machine Shop Company have declared a dividend of \$25 per share, payable November 15.

The Pratt & Whitney Company have declared the usual quarterly dividend of 1½ per cent. on their preferred stock, payable November 15.

The Niles-Bement-Pond Company have declared the regular quarterly dividend of 1½ per cent. on their preferred stock, payable November 15.

A Large Southern Shipbuilding Project.

A project contemplating the establishment of a shipbuilding plant on the Gulf Coast is now in the hands of New York and Southern capitalists. The company, to be known as the Gulf Coast Shipbuilding & Dry Dock Company, have been incorporated under the laws of Alabama. It is intended to construct and operate a modern shipbuilding and marine railway plant on the Bay of Mobile and a dry dock and ship repairing plant at the port of New Orleans. An option has been obtained upon about 2000 acres of land on the Bay of Mobile, with a frontage of over 1 mile.

The company have been capitalized at \$5,000,000, and contemplate an issue of \$4,000,000 of first mortgage 35-year 5 per cent. sinking fund bonds to cover the cost of the acquisition, construction and initial equipment of the two plants. These directors have been chosen thus far: Charles W. Jesup, S. B. McConnico and Cassius M. Wicker of this city; Alfred S. Elliott of Wilmington, Del.; Robert C. Morris and Lewis Johnson of New Orleans, and Patrick J. Lyons and E. L. Russell of Mobile. The officers are: President, Charles M. Jesup; vice-president, Cassius M. Wicker; second vice-president and secretary, S. B. McConnico; third vice-president and treasurer, Robert C. Morris.

The Finance Realty Trust Company of New York will finance the new corporation.

National Founders' Association.

The fifth meeting of the National Founders' Association occurs on Wednesday and Thursday of the current week at the Gilsey House, New York, and is in session as we go to press. The opening session, Wednesday morning, was devoted to the address and report of the president, H. W. Hoyt; the report of the treasurer, John R. Russel, and of the secretary, John A. Penton. Further information in regard to the meeting will be given in our next issue.

The New York Machinery Market.

NEW YORK, November 13, 1901.

There is no change in the situation to be noted. The aggregate of orders received in all lines is fair, and the number of inquiries is increasing daily. This heavy inquiry keeps up the tone of the market firmly. It is not only the number of inquiries that is so remarkable, but the character of most of them are worthy of comment. Invariably they come from prominent concerns and forecast extensive operations.

There is a little talk of shading of prices among machine tool merchants, but otherwise prices are unchanged. The cutting referred to is only on the smaller classes of ordinary tools.

Machine Tools.

Considerable interest is always centered in the great railroad interests, as they are frequently heavy purchasers. At this time, however, more than ordinary interest is taken in the machine tool trade by the operations of the Pennsylvania Railroad. It is reported that this company have very important projects in view. The most extensive of these is the establishment of a great shop system at Wilmington, Del. These shops are to relieve the pressure at Altoona, and will cost something like \$1,500,000. Chief Engineer W. H. Brown of Philadelphia writes us that the matter has been under consideration for some months, but is awaiting final settlement until the company ascertain their standing in Wilmington in regard to other matters now under consideration. Another extensive line of work is expected to center in Long Island. Ever since the Pennsylvania interests have acquired the Long Island Railroad this matter has been in formation. The shop system of the Long Island Road has never been up to the Pennsylvania standard, and a marked improvement will be made as soon as the necessary appropriation is allowed. This will probably be done before the close of this year. In the matter of the building of steel cars this company are to do something soon. It is generally believed that this will be taken care of in the extension of the shops of the Cambria Steel Company of Johnstown, Pa., now accredited as being a Pennsylvania interest.

Another announcement regarding prospective railroad shop work which is claiming the attention of the trade is that the Mount Clare shops of the Baltimore & Ohio Railroad are to be greatly extended. A new building will be added, 700 x 240 feet in size.

Elliott C. Smith and Frank P. Holran, who recently purchased the plant and property of the Rogers Locomotive Company, have completed the organization of a new corporation, called the Rogers Locomotive Works, who have purchased all the property and business of the old concern. At a meeting of the Board of Directors, held last week, the permanent officers of the new company were elected as follows: John Havron, president; E. Hope Norton, vice-president; Frank P. Holran, treasurer; George F. Hannah, secretary, and Reuben Wells, general manager, and John W. Griggs, general counsel. The directors of the company are Sir William C. Van Horn, George B. Hopkins, George Turnure, J. D. Probst, Elliott C. Smith, Frank P. Holran, John W. Griggs, Robert C. Pruyn, E. Hope Norton, John Havron and Stephen Peabody. An Executive Committee was also elected, composed of John Havron, chairman, *ex-officio*, and George B. Hopkins, J. D. Probst, Elliott C. Smith, Robert C. Pruyn and Stephen Peabody. The New York office of the company will be located at 33 Wall street. John Havron, president of the company, is the Eastern representative of the Latrobe Steel Company, and previous to 1893 was connected with the Rogers Locomotive Works in various capacities.

Sir William C. Van Horn is the president of the Cuba Company, who are developing railway lines and mining properties in Cuba. Other directors in the company are indirectly interested in railway systems, and the company have orders on their books of sufficient volume to keep the works busy for some months to come.

A considerable quantity of machinery is being purchased, and plans are now being made for a large extension of the works. At present the company are in the market for a heavy electric traveling crane.

Negotiations are pending for the sale to New York capitalists of the plant and stock of the Baldwin Automobile Company of South Connellsville, Pa. If the sale is made it is probable the plant will be started up at once. It has been idle for some time and in the hands of receivers. A party interested in the purchase of this plant states that if the deal is consummated the plant, which is practically new and excellently equipped, will be extended on a large scale. It is very likely that a forging plant will be added among other departments.

The Pittsburgh Machine Tool Company of Allegheny, Pa., have received a contract for part of the machinery equipment for the new works of the British Westinghouse Electric Company, Limited, at Manchester, England. The order consists of 22 lathes, a boring mill and other equipment.

The American Foundry & Machine Company, Hanover, Pa., advise us that they would be pleased to receive catalogues from manufacturers of foundry and machine shop equipments, as they will shortly require a considerable number of machine tools, crane equipments, &c. The company have taken a plant at Glenville, Pa., consisting of foundry and machine shop, which they have had in running shape about six weeks, with a force of 50 men. This plant will be run as an adjunct to their new plant, at Hanover, which will be ready for occupancy April 1. Special attention will be given to machine tool castings and high grade work in the foundry, but what particular line will be followed in the machine shop is not yet definitely decided; it will probably be machine tools. Thomas M. Brown is running the Glenville plant as an individual concern under a company name, but the company will shortly be incorporated with a capital of \$100,000.

We are informed that the Conradson Lathe Company will probably locate at Wheeling, W. Va. The Board of Trade of Wheeling have offered the concern inducements to locate there.

The Max Ams Machine Company, 372-374 Greenwich street, New York City, are about to erect a machine shop at Hoboken, N. J., for the manufacture of canning machinery as applied to a new method of making solderless sanitary cans. Plans for the buildings have just been completed and the matter of equipment is about to be considered.

The Cincinnati Milling Machine Company, Cincinnati, Ohio, made an export shipment of milling machines on the 26th of last month which was rather unique in the number of points of destination to which goods were sent. In this single shipment machines were included for the following foreign points: Manchester, Liverpool and London, England; Brussels, Berlin, Vienna, St. Petersburg, Paris and Japan. This would seem to indicate that the foreign demand in some lines of machine tools is considerably alive.

The Ithaca Gun Company of Ithaca, N. Y., are building an addition to their plant. The new building is to be 90 feet long and two stories high, and is to be equipped with machine tools and special machinery. The equipment has not been purchased as yet.

The Stirling Company, builders of water tube safety boilers, whose shops and foundry are at Barberton, Ohio, and whose general offices are at Chicago, are making some rather elaborate additions to their plant. The company will expend in the neighborhood of \$200,000 in new buildings, tools, equipment, &c., the principal contracts for which have been made. The necessity for these improvements grows out of the largely increased business in the manufacture and sale of Stirling boilers, the orders for which now in hand will keep the present works busy for at least six months. In the marine department the company have two and a half years' work ahead represented by orders closed. These contracts represent boilers for ships being built by the Bath Iron Works, Eastern Shipbuilding Company, New London, Conn.; Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia; Newport News Shipbuilding & Dry Dock Company, Newport News, Va. The report that the

company are to engage in other lines of work than the manufacture of boilers is untrue.

The Wals & Roos Punch & Shear Company have under the laws of the State of Ohio changed their name, and while remaining the same company, will hereafter do business under the name of the Cincinnati Punch & Shear Company; otherwise the organization remains the same. Mr. Christ. Wals is no longer connected with the concern or their business. The officers of the company are: Henry Roos, president; Christ. Roos, vice-president; H. M. Moore, secretary and treasurer. The directors are: F. G. Cross, Christ. Roos, Julius Pfleger, Henry Roos, C. B. Matthews, H. M. Moore.

The Birmingham Iron & Supply Company of Birmingham, Ala., advise us that they are improving their plant and are in the market for shear for cutting up old boiler plate, one small shear suitable for cutting corrugated iron, tin, hoops, &c., also a hoisting engine suitable for raising a 3000-pound ball 60 feet high for breaking heavy castings, and a press for baling thin iron shearings and tin clippings.

The Sessions Foundry Company of Bristol, Conn., advise us that they intend to build an extension to their main foundry building 100 feet long, making the foundry 630 feet, instead of 530 feet, and of uniform width, 110 feet. Steel trusses and posts, electric elevator, cupola and blower will be required.

Whipple & Choate, proprietors of the Bridgeport Deoxidized Bronze & Metal Company of Bridgeport, Conn., are having plans made for another addition to their plant. The new building will be used as an iron foundry. A traveling crane will be installed.

Naval Supplies.

Bids will be opened November 26 at the Bureau of Supplies and Accounts, Navy Department, for delivering the following material at the navy yard, Puget Sound, Wash.:

- Class 1. One 100 horse-power boiler.
- Class 2. One duplex feed pump for 100 horse-power boiler.
- Class 3. One surface condenser for use with 100 horse-power boiler.
- Class 4. One 32-kw. generating set.
- Class 5. One 15 horse-power motor, two 5 horse-power motors.
- Class 6. One 32-inch swing engine lathe.
- Class 7. One 12-inch swing tool room lathe.
- Class 8. One back geared turret lathe.
- Class 9. One 16-inch swing engine lathe.
- Class 10. One hand speed lathe.
- Class 11. One universal milling machine.
- Class 12. One 24-inch pillar shaper.
- Class 13. One open side planing machine.
- Class 14. One drill press.
- Class 15. One sensitive 3-spindle drill press.
- Class 16. One universal grinding machine with attachments.
- Class 17. One 24-inch water tool grinder.
- Class 18. One polishing and buffing lathe.
- Class 19. One grinding stone, trough and frame.
- Class 20. One portable pipe threading machine.
- Class 21. Twenty-four bench legs.
- Class 22. One pattern maker's lathe.
- Class 23. One adjustable saw table.
- Class 24. One four-sided molder.
- Class 25. One 36-inch band saw.
- Class 26. One electroplating outfit.
- Class 27. One ammeter, graduated to 750 amperes; one ammeter, graduated to 300 amperes; one ammeter, graduated to 15 amperes.
- Class 28. One voltmeter, graduated from 0 to 15 volts; two voltmeters, graduated from 0 to 150 volts.
- Class 29. One tachometer.
- Class 30. One photometer.
- Class 31. One testing set.
- Class 32. One cast iron testing plate.
- Class 33. One centrifugal steam separator.
- Class 34. One steam gauge and one vacuum gauge.
- Class 35. Two steam engine indicators.
- Class 36. One steam calorimeter.
- Class 37. Three thermometers.
- Class 38. Instruments, tools, mechanics' clamps, lathe dogs, lathe tools, hand chasers, reamers, drills, files and miscellaneous hardware.
- Class 39. Eight pieces shafting 16 feet long, six pairs flanged couplings, 19 hangers.
- Class 40. Sixty-four feet wrought iron piping, 4 inches diameter.

Plans are now being completed in the Brooklyn Navy Yard for proposed dry dock No. 4. As soon as they are finished they will be forwarded to Washington for approval. The dock is to have a pumping plant situated in the bottom of the caisson and operated by electricity. No such pump has yet been used before in this coun-

try. The electrical power station is to be situated some distance from the dock. Pumping plants of this character are commonly used in connection with dry docks in Europe. It is contended by officials at the yard that the Government will be saved \$70,000 by its use.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until December 3, to furnish at the navy yard, Puget Sound, Wash., bolts, nuts, rivets, screws, pipe and pipe fittings, valves, lead pipe, files, iron, window sashes, glass, hardware, lumber, traveling crane, machine tools, belting, sheet brass and sheet copper.

Awards for naval supplies have been made as follows:

Bids opened October 15, Mare Island yard, to the lowest bidders, excepting classes 9 and 10, which have not yet been decided.

Opened October 22, Boston yard, to the lowest bidders with the following exceptions: Class 10, H. A. Rogers; 11, S. A. Woods Machine Company. No bids having been received for Class 16, purchase of the material will be made in open market.

Opened October 22, Portsmouth yard, to the lowest bidders. Opened October 29 and since that date, not yet decided.

Miscellaneous.

The most important development in the line of machinists' supplies was the advance of prices in leather belting. A detailed report is printed in our Hardware department.

Bids will be received by the Aqueduct Commissioners, New York City, until Tuesday, December 17, 1901, for doing the work and furnishing the materials required to build a pumping plant in the engine room and shaft No. 25 of the new Croton Aqueduct, near 179th street and Amsterdam avenue, New York City. John J. Ryan, president Aqueduct Commissioners.

The plant of the Van Choate Electric Company, located at Foxboro, Mass., is to be sold entire at receivers' sale by the Receivers of the Van Choate Electric Company, 28 State street, Boston, Mass. The plant comprises 12 buildings. The two main buildings are each 60 x 210 feet, and four stories high, which give nearly 100,000 square feet of floor space for work and machinery. All the buildings are of brick, with substantial stone foundations, and as near fire proof as possible. The boilers and engines give from 500 to 750 horse-power, and, together with all the machinery and apparatus, are of the best and latest patterns. The three large engines are Harris Corliss, and the four boilers are the Roberts make. They are run by a first-class duplex system of exhaust draft made by the Sturtevant Company, and the extensive heating system of the plant and the four smaller engines were also furnished by that firm. This plant has been especially designed for the purpose of manufacturing electrical product.

We are informed that the S. Obermayer Company, Cincinnati, Ohio, have opened a warehouse in Pittsburgh, corner of Thirty-fifth and Charlotte streets. The company will carry a full line of foundry facings, supplies and equipments there, and will be in a position to fill all orders promptly. This branch will be known as the Pittsburgh branch of this company.

We are informed that the Westinghouse Electric & Mfg. Company of Pittsburgh have received a very large contract from Bolckow, Vaughn & Co., Limited, of England, for electrical equipment. No details relating to the contract have as yet been received on this side.

Private advices received by the steamer "Victoria," which arrived at Tacoma last week, state that the Japanese Naval Department is preparing to establish a steel plate factory at Kure, at a cost of 6,000,000 yen. The plant will be in working order in three years.

The Standard Traction Brake Company of 120 Liberty street, New York, who have recently been acquired by Westinghouse interests, have received a large order for axle and motor driven brake equipments for the Massachusetts Construction Company, 60 State street, Boston, Mass.

The Standard Pneumatic Tool Company have removed their general offices from Chicago to Aurora, Ill. The company are operating factories at Aurora, and have found it desirable to remove their offices to a closer connection with their manufacturing operations.

HARDWARE.

THE AUSTRALIAN TARIFF.

THE extracts from the new Australian tariff which are given on another page will be regarded with interest as the first full and detailed information which has reached the trade in this country in regard to the provisions of the new law so far as they relate to Hardware, Iron and allied products. Its various provisions will be closely scrutinized, bearing, as they do, so immediately upon the business relations of this country and the Australian Commonwealth. The importance of this trade is indicated in the fact that last year it amounted to \$20,000,000. In cultivating business with the Australian colonies, now unified in such a way that they may almost be regarded as a single nationality, those identified with the Hardware and related trades have given careful and intelligent attention, which has been rewarded with a good measure of success.

It will be seen on a careful analysis of the tariff that it institutes ad valorem duties ranging from 15 to 25 per cent., and in many cases a specific duty representing a broader measure of taxation. So far as the interests of this country are concerned, and as significant of the feeling of the Commonwealth, it is gratifying to observe that there are no provisions giving preference to English goods, but that the tariff applies impartially to importations from whatever source of sale or manufacture. The United States thus has an opportunity to cultivate these markets on equal terms with all other countries.

As of special moment to Hardware manufacturers, it is to be noted that a great many kinds of Hardware and other manufactured products in the metal line are designated in the column entitled "Special Exemptions," and are admitted free. It will thus be seen that many classes of Machinery and such important lines as Wrought Iron Pipe, Wire Cloth and Netting and a large variety of Tools and miscellaneous Hardware and metal articles are entitled to entry free of duty.

The operation of the new tariff will be watched with especial interest in view of the diversity of the policies which were pursued in the separate colonies and the questions which are awaiting solution as to the effect of the tariff in producing revenue and at the same time developing the manufactures of the country. Its publication was received with very varied feelings in the different States, representing, as their past course has done, policies ranging from free trade to comparatively high protection. It remains to be seen whether or not the tariff will be modified in important respects, but at this writing advices indicate that it will probably remain in force with only minor modifications. It is obviously easier to find objections to it than for the advocates of different interests and sentiments to find common ground for united action.

EDITORIAL NOTES.

In a recent article on the influence of technical education upon the industrial prosperity of a country, Prof. V. C. Alderson referred to the advantages gained by Germany in recent years as a proof of the superiority of the industrial educational system followed in that country. Professor Alderson finds that the system of training in technical colleges and schools is the main source of Germany's industrial power, enabling her within recent

years to become one of the great manufacturing nations of the world, and to force her way into foreign markets in competition with the United States and Great Britain. Nevertheless, he is of the opinion that the technical schools in the United States, while not equal to the German schools in point of theoretical training, excel them on the practical side, the American tendency being not only to master knowledge, but to apply it at once. It is this practical efficiency that accounts for the remarkable industrial progress of this country. With the increased facilities for technical training which are constantly being provided there is little doubt this progress will be still further stimulated and accelerated. Not only in the constant improvements which are being made in the production of Iron and Steel, but in their manipulation as they are transformed into the finer finished products are illustrations to be found which emphasize the practical utility of technical training. The American alertness in applying the discoveries of science and in adopting improved methods, which are not always simply labor saving, has much to do with the country's marvelous success in manufacturing.

The mail by which the official copies of the new Australian tariff, referred to at length in the following pages, were received is an illustration of the improvement which may be expected in communication with Australia, by which the business interests of this country will undoubtedly be promoted. The steamer "Ventura," one of the three new 6200-ton vessels of the Oceanic Steamship Company, left Sydney, N. S. W., October 15, Auckland (New Zealand) 19th, Pago Pago (Samoa) 23d and Honolulu 29th, delivering the mail in New York from San Francisco Saturday, November 9, in time to connect with the Cunarder "Umbria," which is expected to land the mail in London four or five days ahead of the regular English mail from Australia via the Suez Canal and Brindisi, Italy, from whence it is rushed across Europe by rail. The enterprise was anticipated by one of similar character last winter in connection with an especially important mail at about the time Australian federation became a fact. There has been some indication of a disposition on the part of the British postal authorities to abandon the mail that crosses the Pacific Ocean and the United States, which record breaking trips such as referred to above should discourage. This incident indicates that the most desirable line of communication with the Australian markets, even for London, will be through this country, a fact which will have an important bearing on commercial relations, and in a business way should be advantageous to our manufacturers and exporting interests generally.

Condition of Trade.

The continued strength of the Iron market is the most important feature of the present condition and has an obvious bearing on the situation in Hardware and related lines. A tone of firmness is thus given to values through the general lines of manufactured products, and especially those in which the raw material is a large part of the cost. Accompanying this firmness in Iron and Steel is the heavy demand for the cruder products and the good demand for Hardware and related lines. At this season orders are for the most part either for, on the one hand, winter and holiday goods and such as are required to complete stocks, or, on the other hand, for next season's delivery, a department of buying which is receiving much attention from the trade. In filling up stocks for winter sale there are many urgent calls

upon both manufacturers and jobbers, and in some kinds of goods there is a decided scarcity. Holiday business promises to be of excellent volume, and merchants are preparing to cultivate this class of trade with more enterprise and liberality than usual with a view to making the most of the opportunities which the season presents. Manufacturers are watching the market closely in view of the condition of the Iron market and are careful not to load up with too many orders. There is also more care on their part than usual in regard to terms and conditions, and they are generally taking a more independent position, refusing to guarantee prices, to accept unspecified orders, and in other ways to favor buyers unreasonably. There is little new in the way of reductions or advances. The market as a whole is steady and pretty evenly maintained. Some lines, the prices of which have been recently broken, are getting into a more settled condition on the new basis. The trade generally feel that they are safe in buying according to their requirements, and in lines which are not regarded as under special suspicion on account of indications of weakness or probability of early decline the trade are purchasing with confidence and in good volume.

Chicago.

(By Telegraph.)

This is the season of the year when cold weather is a vital factor to trade. High temperature kills it, and the opposite gives marked activity, for the buying runs largely to seasonable goods. Hence the trade generally welcomes the crisp, bracing weather which appeared last Tuesday. Orders showed its effects immediately. The volume of business is not up to that of October, but the latter was phenomenal. The nearness of Thanksgiving Day has given zest to the demand for Carving Knives and similar goods. And for Stove Fittings there are many orders. Manufacturers of Hardware are generally holding firmly to quotations. Offers of large orders at a discount, methods which formerly were accepted as a natural and usual proceeding, are commonly declined at factory. This is tending in some instances to limit the purchase of goods from makers, but it is tending also to keep the market firm, for shipments are commonly slow. Makers have little opportunity to accumulate stocks. Some attention is being paid to Christmas goods, but it is a little early for any special activity in that direction, though a large trade is anticipated later. Heavy Hardware continues active for the season. Buying for store is not quite so lively, and the shadow of coming inventory is beginning to influence the buyer.

St. Louis.

(By Telegraph.)

The affairs in the Hardware trade seem to be running along at the same high tension as was noted in our last week's report, and jobbers generally are making extra efforts through their sales departments to clear up stocks as far as possible before the inventory days come around. The Wire situation is still a topic of interesting discussion, and considerable guessing is indulged in as to the ultimate outcome. It is probable that the change in temperature will stimulate the demand for Stove Pipe and other goods in special favor at this season. But the cold spell has hardly been with us long enough to be felt to any large degree in this class of materials. Goods in the heavy department are in active demand, and a most satisfactory feeling is expressed.

NOTES ON PRICES.

Wire Nails.—The movement in Wire Nails continues in large volume, while a careful and conservative policy is pursued by the buyers in not purchasing beyond their requirements. The current demand, however, is such as to take up readily the output of the mills, and the amount

of business is very satisfactory, especially as it reflects a very prosperous condition through the country. Owing to the pressure of competition prices are not entirely uniform all over the country, but the leading interests are pursuing a conservative course in adhering as closely as possible to regular prices and thus avoiding an open break in the market. Concessions are, however, obtainable in many cases by the large buyers, and the market is represented in a general way by the quotations of \$2.15 to \$2.30 in carload lots, f.o.b. mill. Differentials between jobbers' and retailers' prices are not usually maintained in the prices made by jobbers to the smaller merchants, and the manufacturers who have recently entered the field are not observing any uniform rule in regard to prices to the larger and smaller trade. Scarcity of cars is interfering to some extent with the production and also with the prompt shipment of Nails from mill.

New York.—In the local market Wire Nails continue in about their previous condition, and demand keeps up to former proportions. The market is represented by the following prices: Small lots at store, \$2.40 to \$2.45. Carloads on dock, \$2.30 to \$2.35. There are but a limited number of carload orders being placed.

Chicago, by Telegraph.—With prices of Wire Nails no lower and perhaps no higher there is a steadying of quotations this week. Jobbers are less ready to give credence to reports of cut prices and to meet them without full investigation. The largest producer has not reduced prices, and this is giving a sustaining influence to the producers who are seeking trade by methods of concessions. There is a fair demand for Nails. Jobbers are quoting carloads at \$2.40, and small lots are selling at \$2.40 to \$2.45.

St. Louis, by Telegraph.—The market prices for Wire Nails are holding very steady, and it seems to be the feeling that any material change is not likely to be felt. Carload lots to retailers at \$2.50 and less than carload lots at \$2.55 to \$2.60.

Pittsburgh.—There is a fair volume of business in Wire Nails, but at the present time there seem to be more Nails than the market will take, and as a result prices are weak and there is a good deal of competition among the larger concerns for desirable orders. It is probable that the output of Wire Nails will be decreased in a short time by the stoppage of some mills that are badly in need of repairs, having been run continuously for many months, owing to heavy demand. If some of the mills are shut down it ought to favorably effect the market. We quote Wire Nails at \$2.15 to \$2.20 in carload lots, and \$2.20 to \$2.30 in less than carload lots, all f.o.b. Pittsburgh.

Cut Nails.—The market for Cut Nails remains unchanged. There is a fairly large demand, and a better assortment is obtainable as the supply of Steel is better. The difficulty of obtaining cars interferes to some extent with prompt shipments from mill. Quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	\$2.10 to 2.15

New York.—In the local market no change has taken place in Cut Nails. The demand is normal, and prices are unchanged. New York quotations for carload and less than carload lots are as follows:

Carload lots on dock.....	\$2.18
Less than carload lots on dock.....	2.23
From store.....	\$2.18 to 2.30

Chicago, by Telegraph.—There is a nominal demand only for Cut Nails, the product being largely neglected. Quotations are unchanged at \$2.35 for small lots.

St. Louis, by Telegraph.—The demand and inquiry for Cut Nails is reported to be on a satisfactory scale, and prices are without change. Small lots from store are quoted from \$2.30 to \$2.35.

Pittsburgh.—The scarcity of Steel is making it somewhat difficult to obtain prompt deliveries on certain sizes of Cut Nails. The market is firm and, considering the season of the year, there is a very fair demand. We

quote for domestic trade, f.o.b. Pittsburgh, plus Tube freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....\$2.05
Less than carload lots.....2.10

Barb Wire.—The demand for Barb Wire shows a decrease as the season advances. The market remains generally steady, while prices are slightly shaded in some cases, because of competition. Prices on the whole are well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....\$2.60
To jobbers in carload lots, Galvanized.....2.90
To jobbers in less than carload lots, Painted.....2.65
To jobbers in less than carload lots, Galvanized...2.95
To retailers in carload lots, Painted.....2.70
To retailers in carload lots, Galvanized.....3.00
To retailers in less than carload lots, Painted.....2.80
To retailers in less than carload lots, Galvanized...3.10

Chicago, by Telegraph.—From Oklahoma and other parts of the Southwest there has sprung up within a few days quite a noticeable trade in Barb Wire. To that distance from the markets goods usually move in carload lots, and quite a number of transactions of that size have been made. Prices are unchanged. Carload lots are quoted at \$2.75 for Painted and \$3.05 for Galvanized. Less than carloads are quoted \$2.85 and \$3.15, respectively, with these prices firmly held.

St. Louis, by Telegraph.—The Barb Wire market is reported to be in a satisfactory condition, and a good demand and inquiry is to be noted. Prices hold at same level as last quoted. Jobbers quote carload lots of Painted at \$2.85 and Galvanized at \$3.15, less than carload lots at \$2.90 for Painted and \$3.25 for Galvanized.

Pittsburgh.—There is only a fair demand for Barb Wire, and, owing to a much larger output, prices are somewhat weak, and concessions are obtainable on good orders. For ordinary business and for domestic trade, we quote as follows: Galvanized Barb Wire, \$2.90 in carload lots to jobbers, and Painted, \$2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh. It should be noted, however, that the above prices are shaded for good orders.

Plain Wire.—Mills are busy, and demand for Plain Wire is generally satisfactory. At competitive points there is some irregularity in price. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.25	\$2.65
To jobbers in less than carload lots.....	2.30	2.70
To retailers in carload lots.....	2.35	2.75
To retailers in less than carload lots.....	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9.....Base.....	\$0.40 extra.
10.....\$0.05 advance over base.....	.40 "
11......10 " " " ".....	.40 "
12 and 12½.. .15 " " " ".....	.40 "
13......25 " " " ".....	.40 "
14......35 " " " ".....	.40 "
15......45 " " " ".....	.75 "
16......55 " " " ".....	.75 "
17......70 " " " ".....	1.00 "
18......85 " " " ".....	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—Little is heard of Plain Wire just now in a jobbing way, but there is a large demand from manufacturers, preparatory to next spring's trade. Prices are steady. Carload lots of Wire are held at \$2.40 and small lots from stock at \$2.50.

Pittsburgh.—Contracts for Plain Wire for shipment in January and February are being placed, and the mills will likely have steady work throughout the winter. Prices continue to be shaded for good orders. For ordinary business we quote the domestic market as follows:

To jobbers in carload lots.....\$2.25
To jobbers in less than carload lots.....2.30

To retailers in carload lots.....2.35
To retailers in less than carload lots.....2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Leather Belting.—An important meeting of the Leather Belting Manufacturers' Association was held yesterday in New York, when the new list given below was adopted. The meeting was called to take action in regard to a further advance in the price of Belting on account of the higher prices ruling for Belting butts. There was some difference of opinion as to whether the advance should be made by means of diminished discounts or by increasing the list prices. On this subject there was an animated discussion, and finally it was decided that list prices should be advanced, discounts remaining substantially as before. This decision was not reached, however, with entire harmony, and two of the members of the association withdrew—namely, Jewell Belting Company, Hartford, Conn., and Detroit Oak Belting Company, Detroit, Mich. This is referred to by some as perhaps a serious matter and rendering difficult the work of the association. The list adopted by the association is as follows, which is subject to discounts to the trade, which in a general way are represented by the following:

Extra Heavy, Short Lap.....50 and 10 to 60 %
Regular, Short Lap.....60 to 60 and 5 %
Standard60 and 10 to 65 and 10 %
Light Standard.....65 to 70 %

Leather Belting, Single.

		Price per running foot.											
Inches	.....	½	¾	1	1¼	1½	1¾	2	2½	3	3½	4	4½
		\$0.10	.12	.14	.16	.17	.23	.29	.35	.41	.47		
Inches	.....	5½	6	6½	7	8	9	10	11	12			
		\$0.53	.59	.64	.70	.76	.82	.87	.98	1.09			
Inches	.....	13	14	15	16	17	18	19	20	21			
		\$2.86	3.08	3.30	3.52	3.74	3.96	4.18	4.40	4.62			
Inches	.....	22	23	24	25	26	27	28	30				
		\$4.84	5.06	5.28	5.50	5.72	5.94	6.16	6.60				
Inches	.....	32	34	36	40	44	48						
		\$7.04	7.48	7.92	8.80	9.68	10.56						
Inches	.....	52	56	60	64	68	72						
		\$11.44	12.32	13.20	14.08	14.96	15.84						

Double Belting, twice the price of Single.

E. P. Alexander of Philadelphia was chosen president of the association; Edward H. Ball, vice-president, and George H. Blake was re-elected secretary and treasurer.

The question of abolishing the duty on hides was brought before the meeting, and resolutions in favor of restoring hides to the free list were unanimously adopted.

Two new members were admitted to the association—L. P. Degen of San Francisco and Samuel Lyon & Son of Chicago. The following firms were represented at the meeting:

Akron Belting Company, Akron, Ohio; Alexander Bros., Philadelphia, Pa.; W. D. Allen Mfg. Company, Chicago, Ill.; C. W. Arny & Son, Philadelphia, Pa.; Bay State Belting Company, Boston, Mass.; Bickford & Francis Belting Company, Buffalo, N. Y.; J. H. Billington & Co., Philadelphia, Pa.; Bradford Belting Company, Cincinnati, Ohio; Chicago Belting Company, Chicago, Ill.; H. N. Cook Belting Company, San Francisco, Cal.; Detroit Oak Belting Company, Detroit, Mich.; Fayerweather & Ladew, New York; Chas. L. Ireson, Boston, Mass.; Jewell Belting Company, Hartford, Conn.; Missouri Belting Company, St. Louis, Mo.; National Leather Belting Company, New York; New York Leather Belting Company, New York; Norwich Belt Mfg. Company, Norwich, Conn.; Page Belting Company, Concord, N. H.; Providence Belting Company, Providence, R. I.; George Rahmann & Co., New York; J. E. Rhoads & Sons, Philadelphia, Pa.; Charles A. Schieren & Co., New York; Shultz Belting Company, St. Louis, Mo.; Union Belt Company, Fall River, Mass.; Charles W. Walker, Newark, N. J.; Thomas Wilby, Chester, Pa.; I. B. Williams & Sons, Dover, N. H.; Wise & Bailey, Philadelphia, Pa.

The Bridgeport Chain Company.—The following are the discounts given by the Bridgeport Chain Company,

Bridgeport, Conn., to good retail Hardware merchants on the large variety of Chains of which they are manufacturers, a freight allowance of not exceeding 25 cents per 100 being given on shipments of not less than 250 pounds; terms 30 days, or 2 per cent. discount for cash in 10 days:

Triumph Chain.		Discount.	
Coil	40 %	Heel	30 %
Halter	40 %	Rein	40 %
Tie Out	65 %	Dog Leads	60 %
Kennel	55 %	Dog Couplers	65 %
Cow Ties (all styles) ..	35 %	Post, Hitching	60 %
Trace	65 %	Picture	45 %
Stake	65 %		

Brown Chain.		Discount.	
Coil	50 and 5 %	Cow Ties (all styles) ..	50, 10 and 5 %
Halter	50 and 5 %	Dog Leads	65 %
Tie Out	70 %	Key, Steel	25 %
Kennel	60 and 5 %	Key, Aluminum	75 %

Perfection Chain.		Discount.	
Coil	60 %	Well	60 %
Halter	60 %	Trace	60 %
Cow Ties (all styles) ..	40 %		

Sash Chain.		Discount.	
Monarch	70 %	Steel, Copper Plated ..	70 %
Steel	70 and 10 %	Fasteners	60 and 5 %

Plumbers' Chain, &c.		Discount.	
All Lists	70 %	Eight Hooks	70 %

Sundries.		Discount.	
Key Rings	50 %	Halter Snaps	5 %

Cordage.—The market for Sisal Rope is somewhat stiffer than it was last week, owing to the firm position of Sisal Hemp, though no change in quotation has been made. The stronger market is indicated by the less desire on the part of manufacturers to urge sales at present prices. No change has taken place in the Manila Rope market. Quotations vary with different manufacturers as follows: Manila Rope, on a basis of 7-16 inch and larger, varies in price with manufacturer from 12½ to 13 cents, and Sisal, on the same basis, from 8½ to 9¼ cents per pound, with ¼ cent rebate for larger lots. Demand is comparatively light at these prices. Quotations on Jute Rope are as follows: Jute Thread Rope, ¼-inch and up, is quoted at 6½ cents for No. 1 and 6 cents for No. 2. Jute Yarn Rope, ¼-inch and up, is quoted at 5 cents per pound.

Glass.—Owing to the agreement between the combined domestic Window Glass manufacturers and the jobbers' association, former quotations are merely nominal. By this agreement jobbers are permitted to sell down, it is understood, to 85 and 20 per cent. discount from store, to meet competition of foreign Glass. In addition to foreign manufacturers, the combined manufacturers have the independent and co-operative factories to protect themselves against. A number of new firms have begun making Glass this fall, and it is understood that they are cutting the price all the way to 20 per cent. They will not co-operate with the combined manufacturers to maintain prices, and are getting, it is said, the most desirable part of the business. The price of Glass, from time to time, therefore, depends upon the price at which outside Glass can be purchased. These prices are not published, so that to obtain figures at which domestic Window Glass may be purchased buyers must go into the market. Local jobbers have an agreed price, which is low enough to compete with foreign Glass. It is understood that orders have been placed by large buyers for carload lots and over at 85 and 25 per cent. discount, for either single or double, and that lower prices have been made on large and desirable orders. Such orders must include a certain percentage of double strength Glass. Some of the Western concerns are making a difference in price between single and double strength, owing to local conditions. Quotations of 89 and 5 per cent. for the first three brackets of single and 85 and 20 for double strength have been made. A meeting of the combined manufacturers and the jobbers' association is scheduled for next week, at which time it is to be decided whether competition is a large enough factor in this market to make it desirable for the com-

bined manufacturers to protect the jobbers' association in the way of prices. If a satisfactory conclusion is reached it is expected that the association will place a large order for Glass to be delivered after the first of the year. Indications point to lower prices for Window Glass.

Paints and Colors.—Leads.—Out of town orders for White Lead in Oil are of satisfactory volume. The fine weather, which has been a feature of the past few weeks, has given an opportunity of finishing up outside work. Irregularity in prices continues, and concessions from regular quotations are reported of ¼ to ½ cent per pound, according to brand. Quotations continue unchanged as follows: In lots of 500 pounds or over, 6½ cents; in lots of less than 500 pounds, 7 cents per pound.

Oils.—Linseed Oil.—The Linseed Oil market continues in an unsatisfactory condition. Buyers want to purchase out of town Raw Oil at 50 cents per gallon. It is a question in the minds of manufacturers' representatives whether, in the event of a large quantity of Oil being offered at that price, buyers would not then want to purchase it still lower. There is a scarcity of Oil for prompt delivery. City Raw, with those who have Oil to sell, is quoted at 60 cents in five-barrel lots. Others who have but little Oil to dispose of continue to quote 65 to 66 cents, according to quality. Out of town Raw is quoted at 57 to 58 cents in five-barrel lots. Boiled Oil is 2 cents per gallon advance on Raw.

Spirits Turpentine.—During the week the demand for Turpentine has been light and confined to small lots. Large consumers have kept out of the local market, probably because they were unwilling to pay current prices. Stocks in yard are sufficient for present needs. Quotations, according to quantity, continue as follows: South-erns, 38 to 38½ cents; machine made barrels, 38½ to 39 cents per gallon.

THE KNIGHT IN THE WINDOW.

The knight in the show window of Morley Bros., Saginaw, Mich., has attracted much attention and favorable comment. His feet and body were constructed in the tin shop of the store from I. C. Roofing Tin, the



The Knight in the Window.

arms being formed of Galvanized Conductor Elbows. The shield was cut from the cover of a Dripping Pan. To form the head and neck respectively a 3-quart Tin Milk Kettle was used, and in this was put a No. 5 Football Players' Helmet with a gauze face. The sword was made of a No. 1 Drill Rod with a No. 8 Hog Scraper for handle. The entire figure was covered with one coat of aluminum and gold bronze paint. This window exhibit was prepared by F. L. Kalde, a retail salesman in the store.

THE AUSTRALIAN TARIFF.

FROM OUR SPECIAL CORRESPONDENT.

Its Bearing on American Trade.

THE first Australian Federal budget was unfolded by the first Australian Federal Treasurer, Sir George Turner, at 3 p.m., Tuesday, October 8, and he was followed at 5.30 by the Minister of Customs, Hon. C. C. Kingston, with the declaration of the first Federal tariff. These letters have in previous issues referred to the unrest caused in commercial circles by the anticipated changes.

To give a clear understanding of the duties imposed it will be necessary to refer briefly to the budget speech before passing on to the various items of the tariff, with which readers of *The Iron Age* are more directly concerned.

Imports for 1899 Basis for Taxation.

The imports for the year 1899, considered a normal year, were taken as a basis for taxation. The total imports into those States in 1899 from abroad approximated £34,000,000. It was estimated that imports would be reduced as the effect of a uniform tariff by about £5,000,000, and this, added to a free list of £6,500,000, and making allowances for Government goods, would reduce the amount of taxable trade to about £21,000,000 annually.

Revenue Necessary for Governmental Purposes.

A revenue of £9,000,000 is required for the Commonwealth, and, deducting excise duties, £1,500,000; this leaves £7,500,000 to be obtained from customs revenue, equal to about 35 per cent. on the goods.

Stimulants and narcotics are expected to raise £3,000,000 of this, so that, deducting these two items, the average percentage works out at 23. *The Iron Age* has for many months past foreshadowed this result.

Protective Features Likely to Stand.

The intentions of the Government have been closely kept, and the protectionist proposals now unfolded have in them all the indications of successful issue. Perhaps the surest sign of this is the fact that no one appears altogether pleased with the policy declared, and yet there are no actually bitter expressions of opinion heard.

The Tariff.

The tariff duties which became effective at the various ports of entry in the Australian Commonwealth at 4 p.m., October 8, Victorian time, are reproduced elsewhere in this issue, so far as they concern *The Iron Age* readers. According to constitutional precedent duties will be collected from the time named above and for any items that fail to pass or which are reduced a rebate may be claimed. In the event of higher schedules, if any are made, no additional payment of duty will be required.

Sections Interesting to Hardware and Allied Trades.

Distinctively Hardware goods will be found in Divisions VI and VIa—Metals and Machinery. Such lines as are closely associated with the Hardware trade and in greater or less degree handled by nearly all Hardwaremen in Australia will be found in Division VII—Oils, Paints and Varnishes, and Division VIII—Earthen Ware, Cement, China, Glass and Stone. Other extracts from the tariff of interest to the trades with which *The Iron Age* is identified are also given.

METALS AND MACHINERY.

Taking heavy goods first, it is of special interest to your merchants to note the clause at the head of "Division VIa—Metals and Machinery," wherein certain duties are laid down to be imposed on manufactured iron, Reapers, Binders, &c., as soon as the Minister is satisfied that the industries are sufficiently established. When the bonuses for the various trades are fixed, the manufacturers will no doubt soon satisfy the Minister.

In the meantime a 10 per cent. ad valorem duty is scarcely sufficient inducement to tempt large capital into the development of local ore deposits. The duty of 10 per cent. on imported pig iron appears to be of no earthly use except to produce some very small propor-

tion of revenue, and much ill feeling from Victorian foundrymen, whose prices are already excessive in consequence of labor legislation.

DOMESTIC IRON MANUFACTURES.

The manufacture of iron from local ores is already started in a small way on the New South Wales side, and this new Australian industry is going to be much advertised and pushed.

Apropos of this subject, your American manufactured iron is still out of the market, not to say unpopular.

This matter has been referred to in my previous letters, so there is no need to recapitulate the defects of the iron, but will merely say that if your mills will conform to British methods and attend to the quality of the iron they still have some chance of getting in here again.

RAILS, FISH PLATES, &C.

Rails, Fish Plates, &c., hitherto free in all colonies except Tasmania, are now to be subject to 15 per cent. ad valorem duty.

Coming events cast their shadows before, and the anticipation of the industry is visible here.

BAR, ROD AND ANGLE IRON.

Bar, Rod and Angle Iron, mostly free in the past, now bears 10 per cent. under provisions of Division VIa. The same is true of iron and steel scrap.

EXEMPTIONS OR NON-DUTIABLE GOODS.

Special exemptions are specified in the right-hand column of the accompanying tariff, and are important.

REAPERS AND BINDERS.

Reapers and Binders, admitted free at present, and a trade in which your country has a fair share, will be subject to a 15 per cent. duty under conditions as per Division VIa. This will no doubt prove eminently satisfactory to local makers, several of whom are fully established, and will undoubtedly reduce the prices of the local importers, who are strongly combined.

The imposition of this duty will give a stimulus to local manufacture, and will probably create a scarcity of skilled labor for this particular industry.

This will be an object lesson for the free trade party, but as a set off against this they have a strong argument against the Wire Nail trade.

WIRE NAILS.

The Victorian duty hitherto has been 7 shillings per cwt., but the new tariff has reduced this to 3 shillings per cwt., say 40 per cent. A revised price-list came out the day after the declaration of the tariff, representing reduced prices, as follows:

Gauge No.	Old price. s. d.	New price. s. d.
0 to 7.....	21 6	14 6
8.....	22	14 6
9.....	22 6	14 9
10.....	23	15
11.....	24	15 6
12.....	25 6	16
13.....	27	16 6
14.....	29 6	17
15.....	30 6	18 6
16.....	32 6	20 6
Less 7½ per cent. on ½-ton lots.	Less 5 per cent. on 5-ton lots.	
Less 5 per cent. on smaller lots.	Less 2½ per cent. on 2-ton lots.	

CHINA AND GLASS

In these trades, in which your country is slowly gaining ground out here, the taxation imposed is likely to provoke severe discussion, and will in all probability be amended.

As compared with the former duty in this State the comparison reads as follows:

Earthen ware.	Old duty. Per cent.	New duty. Per cent.
Common Cups and Saucers, white, printed, &c....	15	40
Common Plates, Dishes, &c., white, printed, &c....	15	35
Ewers and Basins, white, printed, &c.....	15	55
Printed Toilet Sets, cheapest makes.....	15	45
Common Jugs.....	15	45
Cheap table glass, such as Jugs, Dishes, Bowls.		
Sugars, &c.....	25	85
Common Pressed Tumblers.....	25	55
Cheap 6d. and 1s. lines of Vases.....	25	75

There is much outcry because the better qualities, such as Cut Glass, &c., are not penalized to anything like the same extent. Duties such as the above will kill

importations, although our small local manufacturers will enjoy such prohibition.

BASIS OF COMPARISONS.—The foregoing table of new duties is worked out on the new tariff (regarding Glassware) of 8 pence per foot, outside measurement, and 15 per cent. ad valorem. Under our former tariff of 25 per cent. for common pressed Tumblers the ordinary Tumbler was formerly subject to a duty payment of 2 shillings 6 pence per gross, and was retailed at 2 shillings per dozen, allowing a profit to the retailer of 3 or 4 pence. The new tariff works out to 4 shillings 9 pence a gross, thus increasing the actual cost to 1 shilling 11 pence a dozen.

GLASS TRADE BARRIER.—The National Glass Company of America, who have been doing good business in various lines of Table Glass in Australia, will have to take this into consideration. American imports here equal about one-third the trade, and are steadily growing. The

would pay £20 in duty on this item alone—say the landed cost of a Reaper and Binder itself.

LEATHER BELTING

Leather Belting is dutiable at 20 per cent. ad valorem; 15 per cent. is imposed on Leather imported for the purpose of manufacture, the remaining 5 per cent. being available to help local industry. We expect to see this increased under discussion. Cotton Belting is duty free.

HORSESHOE NAILS.

Horseshoe Nails are reduced from 14 shillings to 7 shillings per cwt. Local manufacturers have a big pull on the market, aided by the duty. Other Nails, 3 shillings instead of 7 shillings 6 pence per cwt.

LAMPS AND LAMPWARE.

Lamps and Lampware are uniform at 20 per cent., duties hitherto ranging from 15 to 30 per cent. in the different colonies. The season just closed has been a



Buffalo Exhibit of Abner Acetylene Gas Company.

increased duty will handicap your country in favor of the local article.

GALVANIZED IRON.

The duty on plain Galvanized Iron is fixed at 15 shillings per ton, and on Corrugated Galvanized Iron at 30 shillings per ton. Hitherto these lines have been duty free in New South Wales and Victoria; South Australia has had a duty of 30 shillings a ton on Corrugated Galvanized Iron, and Queensland has had 40 shillings a ton on both. Now, with the one Australian market, this duty should be sufficient to justify the further erection of galvanizing and corrugating plants, since Black Sheets are duty free.

A LEADING AUSTRALIAN STAPLE.—Australia is perhaps the world's best market for Galvanized Corrugated Iron, as the majority of our country and suburban small villas, farms, &c., are roofed with it.

BINDER TWINE.

Binder Twine duty is declared at 8 shillings per cwt., the duty hitherto existing in Victoria, Queensland and South Australia. Taking an average farm as having 200 acres cultivated, this means a consumption of 600 pounds of Twine for each harvest. Thus a farmer in 10 years

very good one, especially as regards Hanging Lamps. Needless to say the Miller and Rochester are easily first in popular favor.

BUFFALO EXHIBIT OF ABNER ACETYLENE GAS COMPANY.

The Pan-American exhibit of Abner Acetylene Gas Company, 32-36 La Salle street, Chicago, was located in the Acetylene Building, and contained three generators, one 30-light Abner Junior, one 150-light Abner Giant and one 350-light Abner Giant, all full capacity, installed and in actual operation to show the simple automatic workings of their measured carbide feed and self cleaning system. The novel and certain action of these generators in operation, showing the rising and lowering of the gas bells with each operation of the measured feeding device, was well calculated to attract and impress visitors with the company's claims for a perfect, simple and safe Acetylene Gas lighting system. The company furnish the Abner Junior and Abner Giant Generators in sizes from ten lights to 20,000 lights and upward, and refer to the Buffalo exhibit as successful beyond their expectations in promoting present and prospective business.

THE AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION.

WE give below the constitution and by-laws of the American Hardware Manufacturers' Association, which will be of interest as indicating the character of this organization and the lines on which it is working:

ARTICLE I.

The name of this organization shall be the American Hardware Manufacturers' Association.

ARTICLE II.

The object of this association shall be to further the interests of the manufacturers and promote cordial relations with the distributors.

ARTICLE III.

Any firm or corporation engaged in the manufacture of goods handled by the Hardware trade may, upon the recommendation of the Membership Committee and the unanimous consent of the Executive Committee, become a member of this association upon subscribing to the constitution and by-laws and the payment of a membership fee of \$10. No manufacturer who is also engaged in the jobbing business can become a member, nor are manufacturers' agents eligible to membership in this association.

ARTICLE IV.

Section A. The officers of this association shall consist of a president, three vice-presidents, a secretary-treasurer and an Executive Committee of eight. The president and vice-presidents shall be *ex-officio* members of the Executive Committee, and all shall serve without compensation excepting the secretary-treasurer, whose salary shall be fixed by the Executive Committee.

Sec. B. The president, vice-president and members of the Executive Committee shall be elected at each annual meeting of the association, and shall hold office for the term of one year, or until their successors are elected and qualified.

Sec. C. The secretary-treasurer shall be appointed by, and shall hold office at the pleasure of, the Executive Committee; and shall be required to give such bond for the faithful performance of his duties as the Executive Committee shall deem proper.

Sec. D. The Executive Committee shall have power to fill all vacancies in offices or on committees.

ARTICLE V.

Section A. The president shall appoint a Nominating Committee, consisting of nine members, on the first day of each annual meeting, whose duty shall be to report names for the various elective offices of the association. After the report of the Nominating Committee it shall be the privilege of any member of the association to place in nomination the name of any person he shall desire. These names shall be added to those reported by the Nominating Committee.

Sec. B. The election shall be held on the last day of each annual meeting, and shall be by ballot. Each member of this association shall be entitled to one vote only, and the candidate or candidates who shall receive the majority of the votes cast shall be elected.

ARTICLE VI.

It shall be the duty of the president to preside at all meetings of the association. He shall call special meetings upon written application of ten members of this association.

ARTICLE VII.

It shall be the duty of the vice-presidents to act in the absence of the president, in the usual order.

ARTICLE VIII.

Section A. It shall be the duty of the secretary-treasurer to keep a record of all meetings, to attend to and keep all correspondence of the association, to collect all moneys due the association, and disburse same upon vouchers duly signed by the president, and to perform such other work as may be provided by the president and the Executive Committee.

Sec. B. The Executive Committee shall meet at least twice each year, or upon the call of the president, at such place as the majority of the committee may elect, the expense attendant upon such meeting, except the annual meeting, to be borne by the association. It shall be its duty to perform such work from time to time as may be necessary to carry out the spirit and intent for which the association was organized. It shall have charge of the disbursement of all the funds of the association, elect the secretary-treasurer and fix his salary and bond, and have power to engage such other employees as may be necessary to carry on the work of the association; and, if necessary, make assessments pro rata, not to ex-

ceed \$20 for each member, to defray the legitimate expenses of the association. The reports of all committees shall be referred to it before the same shall be presented to the association.

ARTICLE IX.

Any member may delegate, in case of unavoidable absence, a representative, who shall be a member or employee of said firm or corporation, to represent them at any meeting, who shall present written credentials of the firm or corporation he represents. His vote shall be binding. No proxies shall be allowed.

ARTICLE X.

The annual meeting of the association shall be held on the third Wednesday in November, and at such place as shall be named by resolution at the last previous meeting; but the same may be changed by the president in the event of an emergency warranting such change, same to be subject to the approval of a majority of the Executive Committee. Notice of such change shall be sent to each member at least 30 days previous to the meeting. Special meetings may be called by the president upon written request of not less than ten members. Notices of same shall be sent to each member at least 15 days previous to the meeting. A majority of the members attending shall constitute a quorum for the transaction of business.

ARTICLE XI.

The following standing committees shall be appointed by the president, to serve for one year, or until their successors are appointed, subject to the approval of a majority of the Executive Committee: Membership Committee of nine members, Entertainment Committee of five members and Grievance Committee of five members, and the Executive Committee is authorized to pay the necessary expenses of such committees.

ARTICLE XII.

At all the annual meetings representatives of the press or others may be admitted to the opening session, when reports of the year's work are read, at the discretion of the Executive Committee. All subsequent sessions shall be executive in their character and none but members or applicants for membership shall be admitted, unless by consent of four-fifths of the members present, the vote to be taken in executive session.

ARTICLE XIII.

Any member desiring to withdraw from the association shall give notice to the secretary at least 30 days prior to the annual meeting.

ARTICLE XIV.

Any amendment or alteration of this constitution and by-laws may be made at any regular or special meeting by a vote of two-thirds of all members present and voting.

ARTICLE XV.

ORDER OF BUSINESS.

1. Roll call of members.
2. Reading of minutes of last meeting.
3. President's address.
4. Report of secretary-treasurer.
5. Report of committees.
6. Communications.
7. Unfinished business.
8. New business.
9. Election of officers.

REQUEST FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

Mario Pena has severed his connection with John Early's Sons, and has taken charge of the export department of New York Hardware Company, 54 Stone street, New York, which has lately been organized. The company solicit catalogues, &c., from manufacturers of all kinds of Hardware, Tools, Household goods and specialties for export.

THE HARDWARE MERCHANTS' AND MANUFACTURERS' ASSOCIATION of Philadelphia will be represented at the Reciprocity Convention, which will be held in Washington, November 19, 20 and 21. The following delegates and alternates have been appointed: Delegates: Samuel Disston, C. W. Asbury, Ralph H. North, Thomas Deylin and Hugh McCaffrey. Alternates: E. E. Jackson, John A. Ervien, Chas. Harper, Howard Rowland and A. C. Rex.

THE NEW AUSTRALIAN TARIFF

SO FAR AS IT RELATES TO

HARDWARE, IRON AND RELATED PRODUCTS.

We give below that part of the new Australian tariff referring to Hardware, metals and related goods. The tariff went into effect on October 8 at 4 p.m., Victorian time. It is stipulated that all goods not included among dutiable goods are free, and all imitations are dutiable at the rate chargeable on the goods they imitate, unless such rate is less than the rate which would otherwise be chargeable on the imitations. "N. E. I." means not elsewhere included. "Departmental By-law" means By-law made by the Minister, and published in the "Gazette;" "Proclamation" means proclamation by the Governor-General published in the "Gazette." Everything enumerated in the column "Special Exemptions" is duty free.

The complete official copy of the Tariff Bill is on file at the office of THE IRON AGE and may be consulted by any interested.

DIVISION VI.—METALS AND MACHINERY.

Dutiable Goods.	Duties.	Special Exemptions.
AMMUNITION —viz., Shot, Bullets and Slugs.... per cwt.	7/6	Arms, viz.—Rifles, Military and Match.
ARMS —viz., Rifles, n.e.i., Shotguns, Revolvers, Pistols, Air Guns and Air Pistols, Bayonets, Swords, Fencing Foils and Masks, Gun, Revolver and Pistol Covers, Cases and Fittings, Loading Tools and Cartridge Belts....ad val.	15 per cent.	Apparatus—Diving. Crucibles. Engines—Fire. Machinery (not including Motive Power, Engine Combination or Power Connections, if any), viz.— Cream Separators and Testers. Knitting. Linotype and Monotype. Machinery for scouring, washing, carding, spinning, weaving and finishing the manufacture of fibrous materials. Machinery for the manufacture of paper and for felting. Printing Machines and Presses, and Machinery used exclusively for and in the actual process of electrotyping and stereotyping. Sewing Machine Heads. Stitching Machines. Typewriters, not including stands or cases. Machine Tools used in the following industries and specified in Departmental by-laws: Apparel and attire making, book-binding, boot making, brush making, glass making and working, hat making, India rubber working, leather dressing, metal working, paper cutting, finishing and folding, stone working, tile, pipe and brick making, wood working.
IRON , Plate and Sheet,*—viz.: Plain Galvanized.....per ton. Corrugated Galvanized.....per ton.	15/ 30/	Metal and Manufactures of Metal— Aluminum, Bronze, Yellow Metal, Britannia Metal, Nickel and German Silver, viz.—Pigs, ingots, scrap, blocks, bars, strips, sheets and plates. Anchors over 10 cwt. Anodes and Hooks for plating purposes. Brass, viz.—Scrap, bars, sheets, pipes and tubes. Capsules, Metallic. Chain in the piece. Copper, viz.—Scrap, bars, sheets, pipes and tubes, prepared plates for engravers and lithographers. Cylinders for anhydrous ammonia. Disks, Plow and Harrow. Electrical Material, viz.—Accumulators or Storage Batteries, except Glass Jars, Cable (covered), Carbons, Incandescent Lamps, Testing Meters and Instruments. Eyelets. Fire Extinguishers, Hand. Iron and Steel Tubes or Pipes (except riveted or cast) under 6 inches internal diameter, including Flexible Metal Tubes. Lamps, Miners' Safety. Last Thimbles and Block Fasteners. Leaf and Foil. Locks, Door, including Knobs, Keys and Escutcheons. Pins, viz.—Glmp, solid headed short toilet, plain wire hair, plain safety. Platinum, viz.—Bars, strips, sheets, plates, retorts, pans, condensers, tubing or pipes. Rabbit Traps. Scales, viz.—Chemical, analytical and assay. * Scrap Iron and Steel. Screws, table and music stool. Steel, band or ribbon, for making Band Saws or Band Knives. Steel, rough shaped, for chaff cutter and other Knives. Tin Plates, plain. Tools of trade, not being Machines, viz.—Adzes, Axes, Hatchets, Tomahawks and Cleavers, Augers and Auger Bits, Awls and Awl Hafts, Bevels, Braces and Bits, Braces (ratchet), Bruzzers, Bung Borers, Cards (file and wool), Chisels (except cold and plugging) and Gouges, Clamps, Combs (grain-ing), Compasses, viz., carpenters', coopers' and engineers', Cutters (Holt, Glass Miter and Pipe), Diamonds (glaziers'), Drills, Files and Rasps, Forks (digging, hay, stable and tanners'), Gauges (carpenters' and millwrights'), Gimlets, Hammers (except napping, spalling, quartz, coal, brick and sledge), Hoes (garden and plantation), Irons (hatters', Italian, smoothing, cloth manufacturers' and tailors'), Jewelers' Tools, Knives (hay), Needles and Bodkins, Pincers and Nippers (end cutting), Planes, Pliers, Punches, Rakes (hand), Routers (wheelwrights'), Rules, Tapes and Chains (measuring), Saddlers' Tools, viz., Rein rounders, claw, carving, French edge and patent leather tools, wheels and rosette cutters; Saws, Screw Drivers, Scythes, Sets (rivet and saw), Shears, viz., brush makers', garden, printers', sheep and tinsmiths'; Shovels and Spades, Sickles, Snips (tinsmiths'), Spatulas, Spirit Levels, Spoke Shaves, Shaves and Spoke Trimmers, Squares, Stocks and Dies and Taps for same, Trowels, Vises, Wrenches, Screw (except cycle). Washers and Rivets. Wire, n.e.i., Wire Netting, Wire Cloth, Wire Gauze. Zinc, scrap and sheet, and circles and ingots, bored or unbored, for cyanide gold process.
LAMPS and LAMP WARE , n.e.i., and LANTERNS and LAMP STOVES , and all parts thereof (except Chimneys, Shades and Globes, Gasaliers and Electrolers).....ad val.	20 per cent.	
LEAD , Sheet and Piping.....per cwt.	2/6	
MANGLES , CLOTHES WRINGERS and WASHING MACHINES.....ad val.	20 per cent.	
MANUFACTURES OF METAL —viz.: Agricultural, Horticultural and Viticultural Machinery and Implements, n.e.i., including Mold Boards, Shares and Plow Plates, cut to shape; Sheep Shearing Machines, Horse Gears; Engines, portable, fixed on a locomotive boiler horizontally, with wheels and shafts suitable for transport, Traction and Oil Engines, and Road Making Plows and Machines.....ad val.	15 per cent.	
Cutlery, n.e.i. (including Manicure Sets and Knife Sharpeners); also Instruments, Drawing, Mathematical and Surveying.....ad val.	15 per cent.	
Nails , n.e.i.—viz.: Horseshoe and other wrought or pressed Nails.....per cwt. Wire and other, and Spikes, Staples, Brads and Tacks.....per cwt.	7/ 3/	
Tanks, containing goods or empty, for every 100 gallons or part thereof.....	3/	
Weighing Machines, Weigh Bridges and Scales, n.e.i., also Cash Registers, Computing Machines and Attachments.....ad val.	20 per cent.	
N.E.I. , including Engines, Boilers, Pumps, Machines and Machinery, n.e.i.; also Screws n.e.i., Axles, Springs and Plated and Mixed Metal Ware, including Plated Cutlery....ad val.	25 per cent.	
RAILS , Fish Plates, Tie Plates, Switches, Points, Crossings and Intersections for railways and tramways.....ad val.	15 per cent.	
ROLLED IRON OR STEEL BEAMS , Channels, Joists, Girders, Columns, Trough and Bridge Iron or Steel, not drilled or further manufactured; Shafting, cold rolled, turned or planished; also Bolts and Nuts, and Barbed Wire.....ad val.	20 per cent.	

* To continue only until the coming into force of "Division VIIa, Metals."

DIVISION VI.—METALS AND MACHINERY.

To come into operation on dates to be fixed by proclamation, and, except as to Galvanized Plate and Sheet Iron, exempt from duty in the mean time. Proclamation to issue so soon as it is certified by the Minister that the manufacture of Iron or of Reapers and Binders or of any machinery to which the Proclamation refers has been sufficiently established in the Commonwealth, according to the provisions of any law relating to bonuses for the encouragement of manufactures.

<i>Dutiable Goods.</i>	<i>Duties.</i>	<i>Special Exemptions.</i>
IRON AND STEEL:		
Scrap Iron and Steel, and Pig Iron.....ad val.	10 per cent.	
Ingots, Blooms, Slabs, Billets, Puddled Bars and Loops, or like crude manufactures less finished than Iron or Steel Bars, but more advanced than Pig Iron (except Castings)...ad val.	10 per cent.	
Bar, Rod, Angle, Tee, Sheet, Plate and Hoop, except Galvanized Plate and Sheet.....ad val.	10 per cent.	
Galvanized Plate and Sheet—viz.:		
Plain.....ad val.	10 per cent.	
Corrugated.....ad val.	15 per cent.	
Machinery:		
Reapers and Binders.....ad val.	15 per cent.	
Other machinery referred to in proclamation. ad val.	15 per cent.	

DIVISION VII.—OILS, PAINTS AND VARNISHES.

BLACKING , including Dressings, Soaps, Oils, Inks, Pastes, Polishes, Stains and Varnishes for Leather; Berlin and Brunswick Blacks, Furniture Oil, Paste and Polish, and Bronzing and Metal Liquids.....ad val.	20 per cent.	
GREASES , Axle and Thickened or Solidified Oils; solid and viscous compounds for lubricating, and Tallow unrefined.....per cwt.	4/	
OILS —viz.:		
Cotton Seed, in bulk or otherwise.....per gal.	2/	
(Including Castor), in vessels not exceeding one gallon:		
Quarter-pints and smaller sizes.....per doz.	6d.	
Half-pints and over quarter-pints.....per doz.	1/	
Pints and over half-pints.....per doz.	2/	
Quarts and over pints.....per doz.	4/	
Over a quart.....per gal.	1/4	
In vessels exceeding one gallon—viz.:		
Olive.....per gal.	1/4	
Castor, China, Colza, Linseed, Gasoline, Mineral Spirit Oils, n.e.l., and Cotton Seed when methylated pursuant to departmental by-laws.....per gal.	6d.	
Lubricating (Mineral), Mineral n.e.l., and Kerosene.....per gal.	3d.	
N.E.L.....per gal.	6d.	
PAINTS AND COLORS —viz.:		
Ground, in liquid, partly or wholly prepared for use.....	1/ per cwt. and 15 per cent. ad val.	
Colors, Dry, Dry White Lead, and Patent Dryers and Putty.....per cwt.	1/	
VARNISHES , Varnish Stains, Lacquers, Enamels, Japans, Liquid Sizes, Patent Knotting, Oil and Wood Finishes, Petrifying Liquids, Damp Wall Compositions and Lithographic Varnish.....	1/ per gal. and 15 per cent. ad val.	
		Colors, Artists'. Dyes, dry, not packed for retail sale. Lamp, Ivory, Bone and Vegetable Blacks. London Purple and Paris Green. Sulphate of Copper. Ultramarine Blue. Whiting.

Oil, viz.—Fish, including cod (unrefined), seal, whale, penguin petroleum (crude), Degras, sod. naphtha, benzine, mirbane and turpentine.

DIVISION VIII.—EARTHENWARE, CEMENT, CHINA, GLASS AND STONE.

CEMENT , Portland, Plaster of Paris and other like preparations having magnesia or sulphate of lime as a basis, also Gypsum, not prepared. per cwt.	1/	
CHINA, PARIAN and PORCELAIN WARE and MOSAIC FLOORING.....ad val.	20 per cent.	
EARTHENWARE, BROWN WARE and STONE WARE n.e.l., and Tiles n.e.l.....	6d. per cubic foot* and 15 per cent. ad val.	
FILTERS of all kinds, fire and glazed bricks, fire lumps, Fire Clay manufactures n.e.l., Asphalt and Roofing Tiles.....ad val.	15 per cent.	
GLASS —viz., bent, beveled, heraldic, sandblasted, enameled, embossed, etched, silvered and cut; corners cut, beveled or engraved; panes, prisms and all other framed with metal....ad val.	20 per cent.	
GLASS n.e.l.; also SELTZOGENES and ACCESSORIES and SIPHON BOTTLES.....ad val.	15 per cent.	
GLASSWARE n.e.l.....	8d. per cubic foot* and 15 per cent. ad val.	
GLUE , not Liquid, and GELATINE, SHEET....per lb.	2d.	
GLUE, GELATINE and CEMENTS n.e.l., including mucilage and printers' roller composition. ad val.	20 per cent.	
STONE , including Marble and Slate—viz.:		
Monumental, wrought†.....per cubic foot	5/ and 15 per cent. ad val.	
Wrought n.e.l.....ad val.	20 per cent.	
Roofing slates and unwrought slate slabs. ad val.	15 per cent.	
		Earthenware, viz.—Spurs, stilts and thimbles.
		Glass, viz.—Lenses, unmounted, Locket, Brooch and Watch Glasses. Bottles, empty, of not more than 6 fluid drams capacity. Scientific Instruments and Apparatus, viz.— Instruments for measuring the density of liquids. Scientific Apparatus (glass), viz.—Beakers, Flasks, Test Tubes, Vacuum Tubes, Burettes, Pipettes, Weighing Bottles and Tubes, Eudiometers, Nitrometers, Radiometers, Fat Extraction Tubes, Filter Pumps, Gas Washing, Reduction and Absorption Bulbs and Tubes, Test Measures in centimeters and grains; also Carbonic Acid, Sulphureted Hydrogen, Decomposing Water and Bacteriological Apparatus of Glass.
		Dry Gums, Shellac, Dextrine, Sandarach and Mastic.
		Bath Bricks. Oil and Whet Stones, Grindstones and Millstones. Pestles and Mortars—Agate. Stone, viz.—Sawn or in the rough, n.e.l.

* Measuring outside the packages as imported.

† For purposes of measurement each stone shall be considered a rectangular solid corresponding in measurement to the extreme length, width and height of the stone measured.

DIVISION XIV.—VEHICLES.

BICYCLES, TRICYCLES and similar vehicles; VEHICLES and parts thereof n.e.l.; CYCLE PARTS (except tires), plated, enameled, polished or otherwise completed, or brazed or permanently joined, including cycle accessories, and MOTOR vehicles.....ad val.	20 per cent.
CYCLE parts n.e.l.....ad val.	15 per cent.
VEHICLES —viz.:	
Barouches, Broughams, Landaus, Victorias, Mail Phaetons, Drags and similar vehicles....each	£12 and 15 per cent. ad val.
Express wagons, wagons for carrying goods, single or double seated wagons, four-wheeled buggies—mounted on springs or thorough braces and without tops.....each	£5 and 15 per cent. ad val.

DIVISION XIV.—VEHICLES.—Continued.

Dutiable Goods.	Duties.	Special Exemptions
Hansom cabs; also single or double seated wagons, wagonettes and four-wheeled buggies—with tops.....each	£6 and 15 per cent. ad val.	
Omnibuses and coaches for carrying mails or passengers.....each	£9 and 15 per cent. ad val.	
Tilburys, Dog Carts, Gigs, Boston Chaises, Sulkeys and other two-wheeled vehicles—on springs or thorough braces.....each	£3 and 15 per cent. ad val.	

MISCELLANEOUS.

BAGS, Baskets, Boxes, Cases or Trunks, including fittings—viz.: Fancy, hand, sporting, traveling, picnic, toilet, dressing, glove, handkerchief, collar and work; satchels, reticules, valises and companions.....ad val.	20 per cent.	Bags, Portmanteaux and Trunks (minor articles for)—when not gold, silver or plated.— Buckles, Catches for lids, Chain Links (known also as Link Holders), Clips (fluted), Corners, Frames, Holders for lids, Loops for handles or straps, Nails (fancy), Plates, Rollers, Stars, Catches, Handles, Hinges, Key Plates and Ornaments for portfolios.
BOATS, Launches and Yachts, imported in any vessel, including all fittings.....ad val.	20 per cent.	Baskets, viz.—Carpenters'.
BRUSH WARE—viz.: Carpet Sweepers, Hair Brushes, and Combs (toilet) and Tooth Brushes.....ad val.	15 per cent.	
N.E.I., including brooms, mops, crumb trays and brushes.....ad val.	25 per cent.	
COKE.....per ton.	4/	
CORDAGE and TWINES n.e.i., including Macrame Twines, Fleece Thread and Brush Makers' and Mattress Twines, Engine Packing in rope form, and Halters and other articles manufactured from cord or twine, including nets and netting.....ad val.	20 per cent.	Cordage, viz.— Engine Packing in sheet form. Sewing Silks, Twists, Threads and Cottons and Crochet Cottons. Unserviceable. Metal.
CORKS, Bungs, Net Floats, Cork Mats and other manufactures of cork.....ad val.	15 per cent.	
EXPLOSIVES—viz.: Ammunition and Cartridges n.e.i.....ad val.	20 per cent.	Explosives, viz.— Caps, Percussion. Cartridges, Military. Detonators. Powder, Blasting, common, of which 20 per cent. or less will pass through an 8-mesh sieve. Special Fuse Powder, for the manufacture of fuse under Departmental by-laws.
Fireworks.....ad val.	20 per cent.	
Fuse, per coil of 24 feet or less, and in proportion for any greater quantity.....per coil.	1d.	
Powder, Sporting.....per lb.	4d.	
N.E.I.....per lb.	1d.	
WICKER, BAMBOO, CANE or WOOD.—All articles n.e.i., made of, whether partly or wholly finished, including Bellows, Casks, Shooks, Sashes and Frames, Timber bent, n.e.i., Wood cut into shape for making boxes or doors, Axe and other unattached tool handles, Umbrella Sticks, Walking Sticks and Canes.....ad val.	20 per cent.	Wicker, Bamboo, Cane or Wood, Manufactures of, viz.— Buckets, wooden. Canes and Rattans. Cane, compressed, in sheet and unshaped. Last Blocks, rough turned. Lasts and Trees, wooden.
WATCHES, CLOCKS and CHRONOMETERS n.e.i., and parts thereof, Time Registers and Detectors, Opera, Field and Marine Glasses, Pedometers, Pocket Counters, Kinematographs, Kinetoscopes, Phonographs, Graphophones, Gramophones, Cameras and Magic Lanterns, including accessories.....ad val.	20 per cent.	Ships' Compasses. Ships' Chronometers. Microscopes, Telescopes, Spectacles, except gold or silver; Barometers and Thermometers, except advertising, and Watch and Clock Springs.
INDIA RUBBER or other Hose, and manufactures n.e.i., in which India rubber forms a part, including cycle and vehicle tires.....ad val.	15 per cent.	India Rubber Manufactures, viz.—India rubber, crude or powdered, rubber waste, hard rubber in sheets, rubber thread, boot and apparel elastics. Belting (composition). Harness, Saddles and Whips— Minor articles for— Mountings, including hames, bits and stirrups, not plated, gold or silver.
LEATHER MANUFACTURES n.e.i., Leather cut into shapes, Harness, Razor Straps, Foot Balls and parts thereof, and Whips, including Keepers, Thongs and Lashes.....ad val.	20 per cent.	Leather, viz.—Crust or rough tanned hog skins, goat and Persian sheep.
LEATHER n.e.i., including Green-hide for belting purposes.....ad val.	15 per cent.	

BIGELOW & DOWSE COMPANY'S CATALOGUE.

BIGELOW & DOWSE COMPANY, 229 Franklin street, Boston, Mass., have just issued a comprehensive illustrated catalogue of Hardware and analogous goods, containing 549 pages, each 11 x 8½ inches, bound in heavy board covers. An effort has been made to combine in it articles of Hardware especially suitable for the New England trade, and to embrace the lines carried in stock. This edition is the precursor of a much more complete catalogue of Hardware and allied goods, which will contain 1200 or more pages, to be issued early in 1902. It is the aim of this concern, established in 1839, to present nothing to the trade other than goods of standard quality and as represented.

TRADE ITEMS.

THE CENTRAL STAMPING COMPANY, New York, will after January 1 next occupy the entire building at 24 Cliff street, which is being entirely remodeled to accommodate their business. They have for some years occupied two floors at 25 Cliff Street. Their new offices will be much lighter and more spacious than formerly. In the basement they will carry a small stock to accommodate pick-up buyers. The first and second floors will be devoted to sales and sample rooms, and the third and fourth floors to counting room and offices.

F. E. MYERS & BRO., Ashland, Ohio, are now the own-

ers of patent No. 674,966, dated May 28, 1901, issued to J. H. Burkholder, for improvement in door hangers. This, in connection with prior patents issued to them, is referred to as placing them in a position to control the flexible and stayon feature embodied in the Myers Stayon hanger, on which they are doing a very extensive trade. They advise us of their intention to protect themselves and dealers and to give exclusive agencies.

THE INTERNATIONAL LOCK COMPANY, Providence, R. I., are now occupying a much larger factory on Blackstone street, where their facilities for turning out the Loxit Sash Balances complete are largely increased. After having been thoroughly tested and tried in actual use, this device, which requires no cords and no weights, being automatic in every sense, is being more extensively introduced to the Hardware trade. To facilitate prompt and thorough distribution in New England, the Bigelow & Dowse Company, Boston, have been appointed agents for the Hardware trade in that section and will carry a complete stock.

I. A. WESTON COMPANY, Syracuse, N. Y., have purchased the business known as the Jamesville Mfg. Company, Jamesville, N. Y., and will continue the manufacture of Carriage Gears, Steel Wire Wheels, Hubs, Steel Rims, Automobile Wheels, Steering Devices, &c., at Jamesville, continuing their factory at Syracuse as heretofore. The office will also be in Syracuse. The Weston Company have recently issued a catalogue showing some of their products in the Carriage, Automobile and Bicycle lines.

PERSONALITY AND HUMAN NATURE AS ELEMENTS OF COMMERCIAL SUCCESS.

BY F. E. BONNEY.

"THERE is a great deal of human nature in man," says Judge Haliburton, and he followed the statement with the further one that, "there's more in woman." "Nature draws more than ten oxen," says another of the old philosophers. Horace says, "Though you cast Nature out with a pitchfork, it will still return." "What's born of a hen will scrape." The Spaniards have a proverb that, "The son of an ass brays twice a day."

Business Failures or Successes.

In seeking for the causes of business failures or successes it has often appeared to me that both writers and speakers have frequently failed to take cognizance of elements which contribute not a little to success or failure, or, if they have recognized such elements, have failed to give them the importance which they really deserve.

This may be because such elements do not appear prominently upon the surface, but rather beneath it, or, when they do rise above, are not always recognized by their proper titles. I refer to personality and pure human nature.

These elements have guided or misguided the affairs of men from the time when Eve's overweening curiosity made her a prey to the serpent and Adam fell a victim to feminine cajolery, to the present twentieth century, where human nature is the same, though clothed in the garb of more modern times. The cat, though transformed to a bride, will still pounce upon the mouse, as in the days of *Æsop*.

Tendencies and Peculiarities.

We come into the world human and endowed with a nature that has accompanied the race through all the ages. We each and all of us may have our especial and particular mental peculiarities or tendencies, but others have had them before us and others will have them after us. They are mostly natural and subject to well known and fixed laws.

In general we are much alike and many tendencies we all have in common. Still each individual has a few little peculiarities very much his own, and these we soon come, to some extent, to recognize in each other. We may not all agree as to the importance these tendencies and the knowledge of them in each other play in the game of business, but all will, I believe, agree that they cut somewhat of a figure.

It is Human Nature

to locate the causes of success largely within ourselves and to place the blame of failure upon outside causes and influences. One man succeeds because he has a disposition and mental make up which makes him friends and draws him trade from all directions. Another who lacks the personality of the first succeeds because he understands human nature in others and knows how to play upon and guide into proper channels their various peculiarities and inclinations.

One man fails because his personality is bad, though his methods may be good. Another fails though his personality is good, because he does not understand and appreciate the many peculiarities and tendencies of his fellows. Many succeed and many fail without ever fully realizing or appreciating the real forces which lie at the bottom of their success or failure. The man who is thoroughly conversant with Nature's laws and who knows the causes of certain effects and how to produce, regulate or take advantage of them, has a strong lever with which to do his work.

Self Preservation

is the first law of nature. It is born with us. It is intuitive. It doesn't wait for reason, judgment or fairness. This is shown in times of great danger by the selfishness and brutality of many from whom we would least expect such an exhibition.

We may say we would not exhibit such a spirit. Wait

till we are tried. Next to me is mine. Next to us is ours. This is natural. Now for the application. A man starts in business with ample capital, a good location and all the outward needs for a successful career. He has a bad personality. Customers do not like him. They may think he means well, but they don't like to trade with him. He fails. Why? Will he be honest as to the cause of his failure, even should he know it? If the department store man across the street was a pleasant fellow, will he not lay it to him and his competition?

Another starts out likewise well equipped as to capital, location, &c. He has a pleasant and attractive personality. He is a good fellow. He cannot say "No" to the salesman who asks him to take a gross, instead of a dozen. He can't say the little word to the other good fellow, who wants the goods to-day and will pay next month, next fall and perhaps finally in pork. He fails. Why? Will he be honest? If the catalogue house man in the city bought carefully and sold for cash, will he not lay his failure to catalogue house competition?

Selfishness.

There is nothing more human or more natural than selfishness. This is seen nowhere more forcibly than in trade. Your customer as a rule does not go to the department store or send to the catalogue house because he dislikes you, but because he believes he can do better for himself and his. If the catalogue house or department store man gets his trade, it is because they have made him believe this. They recognize this trait of human character and cater to it. Wouldn't you do the same if you had the capital and the opportunity? Now be honest.

Do you try to take advantage of this human selfishness, and try to show your customer how he is doing best for himself and his by trading with you, even if he has to pay a slightly higher price? Do you show him how some of the money he pays you stays at home to keep up the local church, school, fire company, &c., and do it pleasantly, effectively and persistently? Or do you jump upon him and the catalogue house rough shod and often miss the truth and too sharply attack the customer's judgment, which is a very tender point with him?

How many customers, if too roughly convinced of an error, will refuse to correct the same, simply as a matter of personal pride, or through a dislike to openly come out and admit their judgment was wrong.

Prosperity Despite Competition.

There are hundreds of merchants to-day in cities and villages who are successful and prosperous, notwithstanding much severe competition. They are selling large quantities of goods, getting fair prices and making nice profits and accumulating a competence. In these same cities and villages are other merchants who are not thriving, though they have practically the same conditions to meet.

I do not wish to appear to argue that personality is everything or that an acute knowledge of human nature will always accomplish desirable results. I do, however, believe that these elements are important factors in business success. Barnum said that people liked to be humbugged. They evidently liked Mr. Barnum's way of humbugging. He was careful, however, that his humbugs had no stings. How many men have made fortunes from a knowledge of pure human curiosity? How many men have traded to their profit on human credulity and hope?

A knowledge that men can be easily made to believe what they really want to believe has enabled many a man to enlarge his bank account. In our fights against many evils we have, I fear, many times lost sight of some of our most effective weapons.

We sometimes abuse the catalogue house and department store man. He is doing simply what you or I would do were we in his place, provided, of course, that he is at least fairly honest, and most of them doubtless are. He is buying where he can do the best, selling for cash and making some money. He understands human nature. This knowledge is a part of his stock in trade

and it is yielding him good returns. As long as he is honest we should not criticise him. If he is dishonest and unfair he should be punished, and in any case his sins will ultimately find him out.

The man who sells the department store and the catalogue house at cut prices and allows them to cut prices to the consuming public to a point where the honest retailer cannot compete is the man we are after. His own selfishness has blinded his vision and overshadowed his judgment of the rights and nature of others.

The Manufacturer and the Jobber

are the men we must educate, but we must not attempt it with a club. The tendency of several generations cannot be dissipated in a year. These men know something of the laws of equilibrium and can be taught that the selfishness of a few hundred men cannot stand against the selfishness of several thousand. They are interested in themselves and theirs and will follow the paths which lead to the best results. A few might be driven into these paths. All can be led. There is also a widespread love of absolute and exact justice among men, and the majority will always recognize this principle. Those who will not quickly recognize self interest.

Give the Retailer an Equal Chance:]

Justice demands that thousands of retailers scattered throughout the land and in close touch with the consuming public shall have an equal chance with the department store and catalogue house to make an honest living. There should be equality before commercial as well as before constitutional law. If an appeal to justice fails then let there come an appeal to selfishness. The manufacturer and the jobber are in the market to sell goods at a profit. Who buys the most and pays the best prices, the thousands of retailers, or the hundreds of department stores and catalogue houses?

A Continued and Persistent Appeal

to justice and selfishness will settle these questions.

In pursuing these methods nature and personality should not be lost sight of. Study your men. Use tact and ever keep in mind the influences which govern and shape human conduct. Be fair, be calm, be persistent and above all, be just.

We all have our troubles. We always have had them. We always shall have them. The mills of God grind slowly, but the product that comes from the outlet is always the pure and refined grain, free from chaff and cheat.

Study your mental philosophy, master your moral philosophy and apply the knowledge gained from both to your every day business and social relations, and if you don't achieve at least fair success then the lessons which are intended to be conveyed in this article are all wrong.

McKINNON DASH COMPANY, Buffalo, N. Y., advise us that John T. Groves, who has been their manager at Cincinnati for a number of years, has resigned on account of ill health. Mr. Groves is intending to go South for the winter to try and regain his strength. George Montelth, president of the Dash & Carriage Goods Company, who is winding up the affairs of that concern, is to succeed Mr. Groves as manager at Cincinnati, beginning his duties November 15.

The Clark Hardware Company, Black Hawk, Col., have been incorporated with a capital stock of \$25,000 to carry on the wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements and Mine and Mill Supplies.

The Des Moines Iron Company, Des Moines, Iowa, who some time since purchased the Heavy Hardware department of the J. D. Seeberger business, have lately purchased and placed in their establishment the Heavy Hardware portion of the L. E. Bolton stock, Mr. Bolton continuing in the Shelf Hardware business exclusively.

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PRICE-LISTS, CIRCULARS, &c.

ALUMINUM MFG. COMPANY, Two Rivers, Wis.: Circular illustrating their line of Aluminum Goods, including Oil Cans, House Numbers, Key Chains, Match Safes and Holders, &c. They have recently commenced the manufacture of Aluminum Playing Cards.

ST. ALBANS FOUNDRY COMPANY, St. Albans, Vt.: Catalogue No. 22, illustrating Tread Powers, Sweep Powers, Stalk, Ensilage and Cane Shredders, Fodder Cutters, Threshers, Separators and Cleaners, Circular Saw Frames, Drag Saw Machines, Stump Pullers and Stone Lifters, &c. They also issue a separate pamphlet in the interest of their St. Albans Corn Stalk Shredder.

T. F. WELCH & Co., 65 Sudbury street, Boston, Mass.: Price-list of Gears, Ratchets, Steel Chain, Cast Iron Sprocket Wheels, Close and Open Springs, Knurls, Pulleys, Corner Braces, Box Corners, Shelf Brackets, Hand Drilling Machines, Improved Wire Chuck, Wrenches, Hand Screws, &c.

MARIETTA CASTING COMPANY, Marietta, Pa.: Price-list of their line of Plain, Turned, Tinned and Enamelled Hollow Ware. They are also manufacturers of Refrigerator Tanks, Cooler Wells and Plain Castings.

E. VAN NOORDEN COMPANY, 944 Massachusetts avenue, Boston, Mass.: Catalogue B, which describes in detail Skylights, Ventilators and Sheet Metal Work of galvanized iron or sheet copper for all kinds of buildings, in the construction of which they have had 25 years' experience. They also manufacture Roofing, Gutters, Conductors, Shingles and Corrugated Iron for roofs and siding, metal windows and light iron buildings.

LALANCE & GROSJEAN MFG. COMPANY, 19-21 Cliff street, New York: New and revised catalogue and price-list of their Agate Nickel Steel, Pearl Agate, Peerless, Blue and White, All White and Regal Steel Enamelled Wares. In the 136 pages are illustrated complete lines of Enamel Ware, the various styles of which are illustrated in colors indicative of their actual appearance, some new articles having also been added to the assortments.

RICHMOND SHOVEL & TOOL COMPANY, Richmond, Ind.: 1901 catalogue relating to Shovels, Spades and Scoops. The company call attention to the quality, finish and completeness of their line of these goods, embracing as it does all the varieties usually required.

CHICAGO WHEEL & MFG. COMPANY, 39-45 West Randolph

P. E. Brooks, now in the Hardware and Stove business at Parker, Kan., expects to sell out at that point and to engage under the style of Brooks & Flanagan in the general merchandise line at Bridgeport, O. T., where, in addition to Hardware and Farm Implements, he will carry groceries, boots and shoes, dry goods, &c.

Sioux Falls Hardware Company, Sioux Falls, S. D., have just been organized to carry on the wholesale business at that point. They will be ready to commence operations December 1. The officers of the new company are P. K. Rebok, president; H. F. Leible, vice-president, and Chas. D. Baker, secretary and treasurer.

N. Monroe Marshall, president of the People's National Bank of Malone, N. Y., has purchased the interest of R. C. Thompson in the firm of Thompson Bros., wholesale and retail Hardware merchants, of that city, and the business will hereafter be continued under the style of H. D. Thompson & Co. The business was established in 1860 by H. H. Thompson & Co., whose successors were Thompson Bros.

Never-Break Cooking Utensils.

The Avery Stamping Company, Cleveland, Ohio, have added a smaller sized steel spider to their line of Never-Break cooking utensils. It is designated as their No. 6 breakfast spider. The cooking surface of this size is 7 inches in diameter. It is referred to as very handy for cooking small quantities of ham and eggs, &c. The company state that they have encountered a demand for a spider of this size, which is especially adapted for use in families where there is only a small meal to be cooked, and they are expecting to have a large sale of it.

The Sloyd Kindergarten or Carpenters' Bench Knife.

The Smith & Hemenway Company, 296 Broadway, New York, are offering the knife shown in the accompanying cut. The knife is described as forged from the finest quality of Swedish razor steel, and made in three sizes, with 2½, 2¾ and 3½ inch blades. The handles are all practically the same size. The knife has a very heavy



The Sloyd Kindergarten or Carpenters' Bench Knife.

dolph street, Chicago: Circulars relating to the Gem Sharpening Devices manufactured by them, including Sickle Grinder, Shop Grinders, Tool and Disk Grinder, Lawn Mower Sharpener, Scythe Stone, Oil Stone, Kitchen Steel and Razor Hone.

AMONG THE HARDWARE TRADE.

E. S. Heilman and J. D. Stine have bought out the stock, fixtures and good will of J. Peter Koch, dealer in Hardware, Paints, Glass, Seeds, &c., Reading, Pa., and will continue the business under the style of Heilman & Stine. Mr. Heilman was formerly a member of the firm of Hertzog & Heilman. The new firm expect to be open for business about November 15.

On the night of the 30th ult., the Hardware store of Sullivan & Charest, Moorhead, Minn., was robbed of \$300 worth of Razors, Pocket Knives, Revolvers, &c. The firm have recovered about \$250 worth of the goods, and one of the thieves is now languishing in the county jail.

swaged blade, which is referred to as being desirable for wood carving purposes. Samples and prices will be sent by the company upon application. They state that the knife is used extensively in Europe for wood carving and by carpenters.

The Ideal Gun Cleaner.

The Lefever Arms Company, Syracuse, N. Y., are putting on the market the brass wire gun cleaner herewith illustrated. The brass wire cloth is supported by two yielding springs, the supporting springs causing the wire cloth to exactly adapt itself with even pressure its full surface length throughout the barrels. The manufacturers state that the cleaner will remove from the barrels of any gun the rust, lead or foreign substance that may have accumulated, and that it will positively do the work without scratching the barrels or in any way injuring the choke of the gun. It is explained that the wire cloth being softer than the metal in the barrel, there is no possibility of the wire scratching the barrels, also that the hard high finish produced by the constant use of the cleaner makes the barrels less liable to lead, and that

the cleaner not only does the work effectively, but speedily. The wire cloth is the same material used by the company in finishing the outside of their gun barrels preparatory to browning them. The fact, it is remarked,



The Ideal Gun Cleaner.

that this wire used in obtaining the high polish on the outside of the barrels leaves no mark is evidence that it will not scratch the inside of the barrels. The cleaner is designed to retail for 50 cents.

The B. B. Adjustable Lifting Jacks.

The Bray Mfg. Company, Newark, N. J., are placing on the market a line of adjustable lifting jacks, some of which are shown in the accompanying illustrations. The jacks shown in Fig. 1 represent Nos. 1, 2, 3 and 5, which



No. 1.

No. 3.

Fig. 1.—The B. B. Adjustable Lifting Jacks.

differ from one another in size, adjustability and lifting power. They are made with cast iron bases finished in black japan, a notched steel adjusting spindle or shaft which has a screw thread at the upper end, and a head



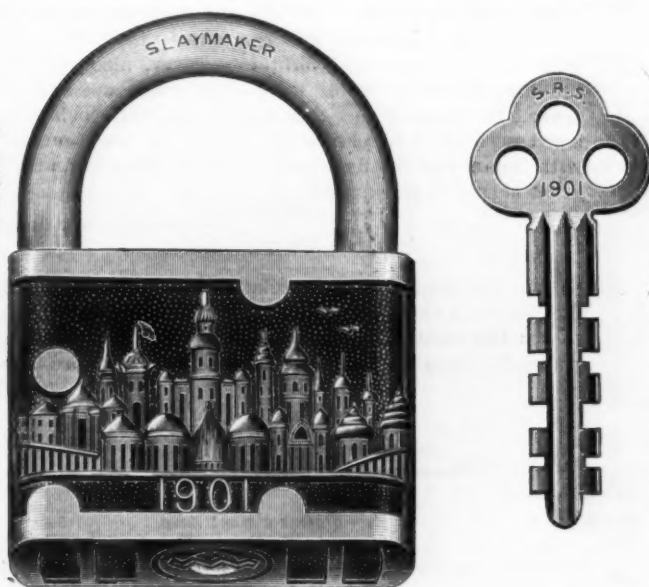
Fig. 2.—The Baby Jack No. 0.

which includes the handle, ratchet, &c., which is of cast iron finished in aluminum bronze. Immediately under the top, upon which the vehicle axle rests when in use and which does not turn, are 16 steel balls. The jack is

placed under the vehicle axle and the spindle lifted until the top of the jack touches the axle, where it is held by a dog in the base engaging in one of the notches of the spindle. The pivoted handle is then raised horizontally and the head is ratcheted up until the wheel is clear of the ground. The ratchet is reversed to lower the wheel. The manufacturers refer to the jacks as strong, light and quickly adjustable, and as adapted to all kinds of vehicles, leveling billiard tables, setting up machinery and for the use of leather manufacturers. Every part of the jacks is interchangeable. Jack No. 1 will raise vehicles weighing from 1500 to 2000 pounds, and will adjust from 12 to 19 inches. No. 5 is made especially for the lowest automobiles and will adjust from 10 to 15 inches. It has the same capacity as No. 1. No. 2 will raise vehicles weighing from 2000 to 3000 pounds and will adjust from 16 to 27 inches. This jack is made for standard vehicles. No. 3 is made for use under fire engines, heavy trucks and trolley cars and will adjust from 16 to 26 inches. This jack, it is stated, will easily lift from 6000 to 8000 pounds. The Baby Jack, Fig. 2, has neither ratchet nor ball bearings. The notched spindle is the same as in the other jacks, but the vehicle is raised by the aid of an eccentric attached to the extension handle. The eccentric works on two rollers, one on each side. This jack is made for light vehicles, and is quick acting, light and portable. It will lift vehicles weighing from 600 to 800 pounds. No. 0 adjusts from 16 to 25 inches. No. 00 adjusts from 12 to 19 inches, and is made especially for light automobiles. The retail price of the jacks ranges from \$1.75 to \$4 each. For the purpose of bringing the jacks to the attention of the hardware trade, manufacturers of carriages and automobiles, the company will furnish cases containing one jack of each size and number, six in all, at \$13.50 per case.

The 1901 Pan-American Padlock.

S. R. Slaymaker, Lancaster, Pa., John H. Graham & Co., 113 Chambers street, New York, selling agents, is putting on the market the Pan-American design pad-

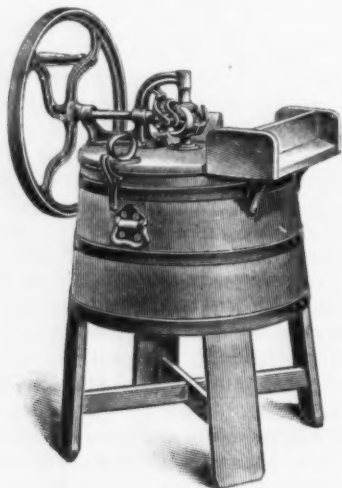


The 1901 Pan-American Padlock.

lock, shown herewith. The shackle is of steel rod, formed with the necessary openings milled, and nickel plated. The shell is of heavy cast brass, with the background finished in chocolate color and the raised surface highly polished. The interior mechanism is so constructed that it requires both sides of the key to operate it. There are a large number of stock key changes, the corrugations in the key combined with the system of interior mechanism, it is explained, affording extreme security. The keys are nickel plated, two keys to each lock. Attention is directed to the automatic action of the shackle, the ample space and the small cross section of the shackle, also to the attractive appearance of the lock.

The Ocean Wave Washing Machine.

Voss Bros. Mfg. Company, Davenport, Iowa, are offering the washing machine shown herewith. It is made on the rotary, reciprocating plan, the reciprocating motion being imparted by a tilting rack. The rack is engaged by a pinion on the fly wheel shaft. As the fly wheel and pinion are revolved the rack is tilted in a position to alternately allow the pinion to travel on the top and bottom sides of the rack, to impart a reciprocating motion to the interior working parts of the machine. The manufacturers remark that all friction is practically eliminated by having no sliding motion to the driving



The Ocean Wave Washing Machine.

mechanism, also that the machine is practically noiseless. The machine is constructed of heavy Mississippi cypress throughout, corrugated sides and bottom, with three heavy flat iron hoops, well painted and varnished, heavy hinges, convenient fastening, &c. The fly wheel is fastened to the shaft by means of a hook or key, which can be readily removed and the wheel taken off, which will make the machine lighter to carry, also relieving the hinges and cover of its weight when opening the cover. It is explained that the wood work being finished with the best paints and varnishes, the iron work with japan, and the fly wheel in wine color, the machine is attractive in appearance.

Bloch's Patent Axle.

The accompanying cuts relate to an axle offered by the Bloch Axle Company, Mobile, Ala. In Fig. 1 is shown the axle reduced and threaded at the shoulder, gradually tapering to the end. Over this slips a sleeve



Fig. 1.—Bloch's Patent Axle.

of metal, shown in Fig. 3, which is threaded at the collar, and screws on at the shoulder of the spindle, to make a firm and close union of the two parts. The axle is made stronger instead of weaker, it is explained, and when the sleeve, upon which is the only wear, becomes



Fig. 2.—Axle Sleeve.

unfit for use, it is only necessary to unscrew and throw away the old sleeve and put another one in its place, making the axle practically new. The whole operation, it is shown, requires but a few moments, and no skilled labor; also the sleeves are made with right and left

threads, and therefore cannot come loose. Fig. 3 shows the ordinary wheel box which goes in the hub and receives the axle. The material of which the axles are made is the best quality of steel, and the sleeves are made of malleable steel. The point is made that after a vehicle is once equipped with these axles worn out spindles can be replaced at one-tenth the cost of the or-

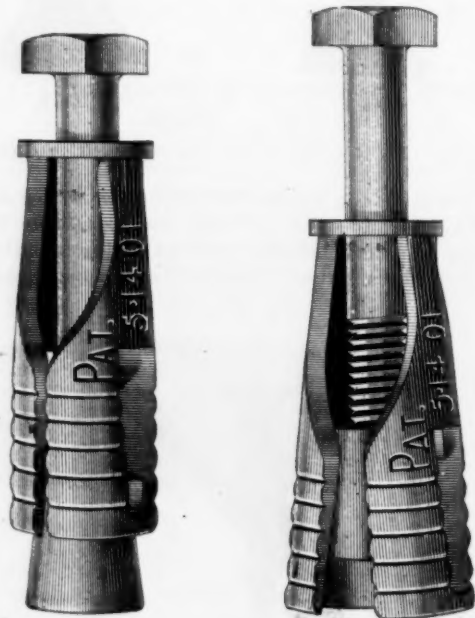


Fig. 3.—Wheel Box.

ordinary way of cutting off and welding on new points. The new sleeves, it is remarked, can be sold at about \$1 per set for buggy sizes, finished and ready to put on the axles, so that for \$1 worn out axles can be replaced, whereas the ordinary cost of welding on a new set in the ordinary way would be \$7 to \$10, besides the annoyance and delay, and the chances of not having the axles properly set.

The Brohard Expansion Bolt.

The Brohard Company, Philadelphia, Pa., are placing on the market a new expansion bolt, illustrated herewith. The device is manufactured of malleable iron and is designed particularly to provide a bolt, having an expansion cover, capable of easy insertion and removal from fixed positions in the wall or other place where it is to be used and which will remain in that fixed position. The parts of the expansion bolt are few, and are so arranged that they cannot become detached from each other. The driving head or spreader is cone shaped



The Brohard Expansion Bolt.

and is in contact along its whole length with the expanding sections of the sleeve. It is held in position by means of suitable lugs or ribs, which are dovetailed into the slotted sides of the expansion case, making it impossible to force the spreader or drawing head from the case. The company are now prepared to furnish these bolts in sizes $\frac{1}{4}$ to 1 inch diameter, and from $1\frac{3}{4}$ to 12 inches in length, larger and special sizes being made according to order and specifications.

Albert Lank has bought the Hardware store and Agricultural Implement business formerly conducted by R. J. Smith, Chrisman, Ill., and will continue at the old stand. Mr. Lank expects to materially increase the stock thus acquired.

Current Hardware Prices.

REVISED NOVEMBER 12, 1901.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33½@33½+10% signifies that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

Cut Prices.—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, 7 doz. \$3.00...33½@33½+10%
North's...33½@33½+10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent...35@55
Tappin's Perfection...30%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Arnold Hammer, Wrought...35@45
Bel Paten, Tren. Co...35@45
Eagle Anvils...35@45
Hay-Budden, Wrought...35@45
Horsehoe brand, Wrought...35@45

Imported—

Peter Wright's...35@45

Anvil, Vise and Drill—

Millers Falls Co., \$18.00...20%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Full Bros. Co.:
Lans of 1 doz...25%
Lans of 2 doz...30%
Lans of 3 doz...30%

Augers and Bits—

Com. Double Spur...70@70+10%
Boring Machine Augers...60@60+10%

Car Bits, 12-in. twist...60@60+10%

Jennings' Pattern

Auger Bits...50@10+5@60%

Ford's Auger and Car Bits...40@10%

Fosbinder Pat. Auger Bits...35%

C. E. Jennings & Co.

No. 10, 12-in. R. Jennings' List...40%

No. 30, R. Jennings' List...50%

Russell Jennings...25@10+2%

L'Honniedieu Car Bits 15@10+15@10+5%

Mayhew's Countersink Bits...45%

Pugh's ending Pattern...30%

Snell's Auger Bits...60%

Snell's Auger Bits...60%

Snell's Car Bits, 12-in. twist...60%

Wright's Jennings Bits (R. Jennings' List)...50%

Bit Stock Drills—

Standard List...65@65+5%

Expansive Bits—

Clark's small, 410; large, 420...50@10%

Lavigne's Clark's Pattern, No. 1, 10 doz., 240; No. 2, 18...50@10%

C. E. Jennings & Co., Steer's Pat...35%

Swan's...60%

Gimlet Bits—

Common Double Cut...gro. \$3.25@2.75

German Pattern...gro. \$3.25@4.50

Hollow Augers—

Bonney Pattern, per doz. \$11.00@11.50

Ames...25@10%

New Patent...25@10%

Universal...20%

Wood's Universal...20%

Ship Augers and Bits—

Ford's...40%

Snell's...40%

C. E. Jennings & Co.

L'Honniedieu's...15@10%

Wetrous'...40%

Awl Hafts, See Hafts, Awl.

Awls—

Brad Awls:

Handled...gro. \$2.75@3.10

Unhandled, Shouldered...gro. \$2.60@2.90

Unhandled, Patent...gro. 60@70%

Peg Awls:

Unhandled, Patent...gro. 31@35c

Unhandled, Shouldered...gro. 65@70c

Scratch Awls:

Handled, Common...gro. \$3.50@4.00

Handled, Socket...gro. \$11.50@12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axles—

Concord, Loose Collar...45@55c

Concord, Solid Collar...45@55c

No. 1, Common...35@45c

No. 1, Com. New Style...35@45c

No. 2, Solid Collar...35@45c

No. 11 to 15...70@10+10%

Nos. 15 to 18...75@75+10%

Nos. 19 to 22...75@75+10%

Boxes, A 10—

Common and Concord, not turned...15, 4-4 24+5c

Common and Concord, turned...15, 4-4 24+5c

Half Patent...15, 4-4 24+5c

Full Patent...15, 4-4 24+5c

Spring Balances...50@10+5@10+5%

Chatillon's:

Light Spz. Balances...40@10%

Straight Balances...40%

Circular Balances...40%

Large Dial...40%

Small...40%

Barb Wire—See Wire, Barb.

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb...24@3c

Beams, Scale—

Scale Beams, List Jan. 12, '85...40@10%

Chatillon's No. 1...30%

Chatillon's No. 2...40%

Beaters—Egg—

Standard Co.:

No. 5 Steel Handle Dover...gro. \$6.50

No. 10 Cast Handle Dover...gro. \$8.00

No. 10 St. ei Handle Dover...gro. \$8.00

No. 15 Ex. Hy. Steel Hall...gro. \$15.00

Rival...gro. \$15.00

Taplin Mfg. Co.:

No. 60 Improved Dover...\$6.50

No. 75 Improved Dover...\$7.50

No. 75-2 Imp'd Dover, Tin'd...\$9.00

No. 100 Improved Dover...\$8.00

No. 100 Improved Dover, Tin'd...\$9.50

No. 150 Improved Dover, Hotel...\$15.00

No. 152 Imp'd Dover, Hotel...\$15.00

Lyon's, Standard size...\$7.00

Wonder (U. S. & Co.)...gro. \$7.50

Bellevue—

Blacksmiths, Standard List...70@70+10%

C. E. Jennings & Co., Blacksmith...60@10%

C. E. Jennings & Co., Hand...35@45

Blacksmiths—

Inch...30 32 34 36 38 40

Eac...\$3.50 3.75 4.25 4.50 5.35 6.15

Extra Length:

Eac...\$4.00 4.55 5.10 5.60 6.40 7.50

Molders—

Inch...9 10 11 12 14 16

Doz...\$6.75 7.25 8.50 9.50 12.00 14.50

Hand—

Inch...6 7 8 9 10 12

Doz...\$3.75 4.25 4.50 5.00 5.75 6.75

Bells—Cow—

Ordinary goods...75@5@75@10%

High grade...70@70+10%

Jersey...75@10%

Texas Star...50%

Door—

Abbe's Gong...45%

Barton Gong...55%

Rome, R. & E. Mfg. Co.'s...55@10%

Lever and Pull, Sargent's...40@40+10%

Yankee Gong...30%

Hand—

Hand Bells, Polished...60@5@65%

White Metal...65@55@10%

Nickel Plated...50@65@10%

Swiss...60@60+10%

Silver Chime...85@35@10%

Miscellaneous—

Form Bells...lb \$2@40

Steel Alloy Church and School...50@10+5@60%

National Bell Foundry Co.:

Superior Cast Steel Church and School Bells...50@10+5@60%

Wilmot & Hobbs Mfg. Co., Gongs...70%

Belting—Rubber—

Agricultural (Low Grade)...75@10+5@10%

Common Standard...75@75+10%

Standard...70@70+10%

Extra...60@10+5%

High Grade...50@10+5@10+5%

Seamless Stitched, Imperial...45%

Boston Belting Co...40@5%

Nisgara...60@5%

Leather—

Extra Heavy, Short Lap...70@10+60%

Regular Short Lap...60@60+5%

Standard...60@10+65@10%

Light Standard...65@70%

Cotton—

Rossendale-Reddaway B. & H. Co.:

Sphinx B and...60@10%

Durable Bran I...70%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters...20%

Stoddard's Lightning Tire Upsetters...40@50%

Bicycle Goods—

John S. Leng's Son's 1899 List:

Chain...50%

Parts...50%

Spokes...50%

Tub...60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—

See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—Tackle—

Common Wooden...70@10+75%

Cleveland's teel...60@10+70%

Ford's Star Brand Self Lubricating...60@10%

Hollow Steel, Ford's Pat. Star Brand...50@10%

Lane's Patent Automatic Look and Junior...30%

Stowell's Novelty, Mal. Iron...50@10%

See also Machines, Hoisting.

Boards Stove—

Zinc, Crystal, &c...40@10+5%

Boils—

Carriage, Machine &c.—

Common, list Jan. 31, '95...65@24@...

Norway Iron, \$3.00, list Oct. 7, '95...80@80+5%

Phil. Eagle, \$3.00 list May 21, '93...80@80+10%

Bolt Ends, list Jan. 31, '95...70@70+10%

Machine, list Oct. 1, '99...70@34@...

Machine with C. & T. Nuts...65@74@...

NOTE—The rapid advances in manu-

facturers' prices enable the jobbers to cut

prices freely.

Door and Shutter—

Cast Iron Burrel, Round Brass Knob:

Inch...3 4 5 6 8

Per doz...\$2.26 3.75 5.25 6.75 8.25

Cast Iron Spring Foot:

Inch...6 8 10

Per doz...\$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned:

Inch...6 8 10

Per doz...\$0.75 1.05 1.50

Cast Iron Shutter, Brass Knobs:

Inch...6 8 10

Per doz...\$0.57 .80 1.00

Wrought Barrel Brass Knob:

Inch...3 4 5 6 8

Per doz...\$1.44 .50 .61 .70 1.28

Wrought Barrel...70@10+75@5%

Wrought Flush, B. K. 50@10+60@10%

Wrought Shutter...40@10+10+60@5%

Wrought Square Neck...50@50+10%

Wrought Sun...50@50+10%

Ives' Patent Door...60%

Stove and Plow—

Plow...60@5@...

Stove...77%

Tire—

Common...77%

Norway Iron...80@30+5%

American S-raw Company:

Gates, Molasses and Oil

Gauges—
 Marrying, Mortise, etc. 55¢ 10¢ 55¢ 10¢ 10¢
 Barrett's Comb. Roller Gauge 55¢ 10¢ 55¢ 10¢ 10¢
 Stanley R. & L. Co.'s Butt & Babbet 55¢ 10¢ 55¢ 10¢ 10¢
 Wire, Brown & Sharpe's 55¢ 10¢ 55¢ 10¢ 10¢
 Wire, Morse's 55¢ 10¢ 55¢ 10¢ 10¢
 Wire, P. S. & W. Co. 55¢ 10¢ 55¢ 10¢ 10¢

Climets—Single Cut

Nail, Metal, Assorted, gro. \$1.50 @ 1.60
 Spike, Metal, Assorted, gro. \$2.80 @ 3.25
 Nail, Wood Handled, Assorted, gro. \$1.75 @ 2.00
 Spike, Wood Handled, Assorted, gro. \$3.25 @ 3.50

Class, American Window

Jobbers' List, Jan. 21, 1901
 Less than Carloads 80¢ 20¢
 Carloads 85¢ 5¢
 1000 Boxes 87¢

Glue—Liquid, Fish

List A, Bottles or Cans, with Brush 37¢ 1/2 @ 50¢
 List B, Cans (1/2 pts., pts., qts.) 35¢ 1/2 @ 18¢
 List C, Cans (1/2 gal., gal.) 25¢ 1/2 @ 15¢
 International Glue Co. (Martin's) 40¢ 10¢ @ 35¢

Glue Pots—See Pots, Glue

Grease, Axle—
 Common Grade, gro. \$5.00 @ 6.00
 Dixon's Everlasting, 10-lb pails, ea. 95¢
 Dixon's Everlasting, in bxs. 90¢ 10¢
 \$1.20; 2 lb \$2.00

Grindstones

1 qt. cans, per doz. \$2.00; 2 qt., \$3.20; 3 qt., \$4.50; 4 qt., \$5.80; 5 qt., \$7.10; 6 qt., \$8.40; 7 qt., \$9.70; 8 qt., \$11.00; 9 qt., \$12.30; 10 qt., \$13.60; 11 qt., \$14.90; 12 qt., \$16.20; 13 qt., \$17.50; 14 qt., \$18.80; 15 qt., \$20.10; 16 qt., \$21.40; 17 qt., \$22.70; 18 qt., \$24.00; 19 qt., \$25.30; 20 qt., \$26.60; 21 qt., \$27.90; 22 qt., \$29.20; 23 qt., \$30.50; 24 qt., \$31.80; 25 qt., \$33.10; 26 qt., \$34.40; 27 qt., \$35.70; 28 qt., \$37.00; 29 qt., \$38.30; 30 qt., \$39.60; 31 qt., \$40.90; 32 qt., \$42.20; 33 qt., \$43.50; 34 qt., \$44.80; 35 qt., \$46.10; 36 qt., \$47.40; 37 qt., \$48.70; 38 qt., \$50.00; 39 qt., \$51.30; 40 qt., \$52.60; 41 qt., \$53.90; 42 qt., \$55.20; 43 qt., \$56.50; 44 qt., \$57.80; 45 qt., \$59.10; 46 qt., \$60.40; 47 qt., \$61.70; 48 qt., \$63.00; 49 qt., \$64.30; 50 qt., \$65.60; 51 qt., \$66.90; 52 qt., \$68.20; 53 qt., \$69.50; 54 qt., \$70.80; 55 qt., \$72.10; 56 qt., \$73.40; 57 qt., \$74.70; 58 qt., \$76.00; 59 qt., \$77.30; 60 qt., \$78.60; 61 qt., \$79.90; 62 qt., \$81.20; 63 qt., \$82.50; 64 qt., \$83.80; 65 qt., \$85.10; 66 qt., \$86.40; 67 qt., \$87.70; 68 qt., \$89.00; 69 qt., \$90.30; 70 qt., \$91.60; 71 qt., \$92.90; 72 qt., \$94.20; 73 qt., \$95.50; 74 qt., \$96.80; 75 qt., \$98.10; 76 qt., \$99.40; 77 qt., \$100.70; 78 qt., \$102.00; 79 qt., \$103.30; 80 qt., \$104.60; 81 qt., \$105.90; 82 qt., \$107.20; 83 qt., \$108.50; 84 qt., \$109.80; 85 qt., \$111.10; 86 qt., \$112.40; 87 qt., \$113.70; 88 qt., \$115.00; 89 qt., \$116.30; 90 qt., \$117.60; 91 qt., \$118.90; 92 qt., \$120.20; 93 qt., \$121.50; 94 qt., \$122.80; 95 qt., \$124.10; 96 qt., \$125.40; 97 qt., \$126.70; 98 qt., \$128.00; 99 qt., \$129.30; 100 qt., \$130.60; 101 qt., \$131.90; 102 qt., \$133.20; 103 qt., \$134.50; 104 qt., \$135.80; 105 qt., \$137.10; 106 qt., \$138.40; 107 qt., \$139.70; 108 qt., \$141.00; 109 qt., \$142.30; 110 qt., \$143.60; 111 qt., \$144.90; 112 qt., \$146.20; 113 qt., \$147.50; 114 qt., \$148.80; 115 qt., \$150.10; 116 qt., \$151.40; 117 qt., \$152.70; 118 qt., \$154.00; 119 qt., \$155.30; 120 qt., \$156.60; 121 qt., \$157.90; 122 qt., \$159.20; 123 qt., \$160.50; 124 qt., \$161.80; 125 qt., \$163.10; 126 qt., \$164.40; 127 qt., \$165.70; 128 qt., \$167.00; 129 qt., \$168.30; 130 qt., \$169.60; 131 qt., \$170.90; 132 qt., \$172.20; 133 qt., \$173.50; 134 qt., \$174.80; 135 qt., \$176.10; 136 qt., \$177.40; 137 qt., \$178.70; 138 qt., \$180.00; 139 qt., \$181.30; 140 qt., \$182.60; 141 qt., \$183.90; 142 qt., \$185.20; 143 qt., \$186.50; 144 qt., \$187.80; 145 qt., \$189.10; 146 qt., \$190.40; 147 qt., \$191.70; 148 qt., \$193.00; 149 qt., \$194.30; 150 qt., \$195.60; 151 qt., \$196.90; 152 qt., \$198.20; 153 qt., \$199.50; 154 qt., \$200.80; 155 qt., \$202.10; 156 qt., \$203.40; 157 qt., \$204.70; 158 qt., \$206.00; 159 qt., \$207.30; 160 qt., \$208.60; 161 qt., \$209.90; 162 qt., \$211.20; 163 qt., \$212.50; 164 qt., \$213.80; 165 qt., \$215.10; 166 qt., \$216.40; 167 qt., \$217.70; 168 qt., \$219.00; 169 qt., \$220.30; 170 qt., \$221.60; 171 qt., \$222.90; 172 qt., \$224.20; 173 qt., \$225.50; 174 qt., \$226.80; 175 qt., \$228.10; 176 qt., \$229.40; 177 qt., \$230.70; 178 qt., \$232.00; 179 qt., \$233.30; 180 qt., \$234.60; 181 qt., \$235.90; 182 qt., \$237.20; 183 qt., \$238.50; 184 qt., \$239.80; 185 qt., \$241.10; 186 qt., \$242.40; 187 qt., \$243.70; 188 qt., \$245.00; 189 qt., \$246.30; 190 qt., \$247.60; 191 qt., \$248.90; 192 qt., \$250.20; 193 qt., \$251.50; 194 qt., \$252.80; 195 qt., \$254.10; 196 qt., \$255.40; 197 qt., \$256.70; 198 qt., \$258.00; 199 qt., \$259.30; 200 qt., \$260.60; 201 qt., \$261.90; 202 qt., \$263.20; 203 qt., \$264.50; 204 qt., \$265.80; 205 qt., \$267.10; 206 qt., \$268.40; 207 qt., \$269.70; 208 qt., \$271.00; 209 qt., \$272.30; 210 qt., \$273.60; 211 qt., \$274.90; 212 qt., \$276.20; 213 qt., \$277.50; 214 qt., \$278.80; 215 qt., \$280.10; 216 qt., \$281.40; 217 qt., \$282.70; 218 qt., \$284.00; 219 qt., \$285.30; 220 qt., \$286.60; 221 qt., \$287.90; 222 qt., \$289.20; 223 qt., \$290.50; 224 qt., \$291.80; 225 qt., \$293.10; 226 qt., \$294.40; 227 qt., \$295.70; 228 qt., \$297.00; 229 qt., \$298.30; 230 qt., \$299.60; 231 qt., \$300.90; 232 qt., \$302.20; 233 qt., \$303.50; 234 qt., \$304.80; 235 qt., \$306.10; 236 qt., \$307.40; 237 qt., \$308.70; 238 qt., \$310.00; 239 qt., \$311.30; 240 qt., \$312.60; 241 qt., \$313.90; 242 qt., \$315.20; 243 qt., \$316.50; 244 qt., \$317.80; 245 qt., \$319.10; 246 qt., \$320.40; 247 qt., \$321.70; 248 qt., \$323.00; 249 qt., \$324.30; 250 qt., \$325.60; 251 qt., \$326.90; 252 qt., \$328.20; 253 qt., \$329.50; 254 qt., \$330.80; 255 qt., \$332.10; 256 qt., \$333.40; 257 qt., \$334.70; 258 qt., \$336.00; 259 qt., \$337.30; 260 qt., \$338.60; 261 qt., \$339.90; 262 qt., \$341.20; 263 qt., \$342.50; 264 qt., \$343.80; 265 qt., \$345.10; 266 qt., \$346.40; 267 qt., \$347.70; 268 qt., \$349.00; 269 qt., \$350.30; 270 qt., \$351.60; 271 qt., \$352.90; 272 qt., \$354.20; 273 qt., \$355.50; 274 qt., \$356.80; 275 qt., \$358.10; 276 qt., \$359.40; 277 qt., \$360.70; 278 qt., \$362.00; 279 qt., \$363.30; 280 qt., \$364.60; 281 qt., \$365.90; 282 qt., \$367.20; 283 qt., \$368.50; 284 qt., \$369.80; 285 qt., \$371.10; 286 qt., \$372.40; 287 qt., \$373.70; 288 qt., \$375.00; 289 qt., \$376.30; 290 qt., \$377.60; 291 qt., \$378.90; 292 qt., \$380.20; 293 qt., \$381.50; 294 qt., \$382.80; 295 qt., \$384.10; 296 qt., \$385.40; 297 qt., \$386.70; 298 qt., \$388.00; 299 qt., \$389.30; 300 qt., \$390.60; 301 qt., \$391.90; 302 qt., \$393.20; 303 qt., \$394.50; 304 qt., \$395.80; 305 qt., \$397.10; 306 qt., \$398.40; 307 qt., \$399.70; 308 qt., \$401.00; 309 qt., \$402.30; 310 qt., \$403.60; 311 qt., \$404.90; 312 qt., \$406.20; 313 qt., \$407.50; 314 qt., \$408.80; 315 qt., \$410.10; 316 qt., \$411.40; 317 qt., \$412.70; 318 qt., \$414.00; 319 qt., \$415.30; 320 qt., \$416.60; 321 qt., \$417.90; 322 qt., \$419.20; 323 qt., \$420.50; 324 qt., \$421.80; 325 qt., \$423.10; 326 qt., \$424.40; 327 qt., \$425.70; 328 qt., \$427.00; 329 qt., \$428.30; 330 qt., \$429.60; 331 qt., \$430.90; 332 qt., \$432.20; 333 qt., \$433.50; 334 qt., \$434.80; 335 qt., \$436.10; 336 qt., \$437.40; 337 qt., \$438.70; 338 qt., \$440.00; 339 qt., \$441.30; 340 qt., \$442.60; 341 qt., \$443.90; 342 qt., \$445.20; 343 qt., \$446.50; 344 qt., \$447.80; 345 qt., \$449.10; 346 qt., \$450.40; 347 qt., \$451.70; 348 qt., \$453.00; 349 qt., \$454.30; 350 qt., \$455.60; 351 qt., \$456.90; 352 qt., \$458.20; 353 qt., \$459.50; 354 qt., \$460.80; 355 qt., \$462.10; 356 qt., \$463.40; 357 qt., \$464.70; 358 qt., \$466.00; 359 qt., \$467.30; 360 qt., \$468.60; 361 qt., \$469.90; 362 qt., \$471.20; 363 qt., \$472.50; 364 qt., \$473.80; 365 qt., \$475.10; 366 qt., \$476.40; 367 qt., \$477.70; 368 qt., \$479.00; 369 qt., \$480.30; 370 qt., \$481.60; 371 qt., \$482.90; 372 qt., \$484.20; 373 qt., \$485.50; 374 qt., \$486.80; 375 qt., \$488.10; 376 qt., \$489.40; 377 qt., \$490.70; 378 qt., \$492.00; 379 qt., \$493.30; 380 qt., \$494.60; 381 qt., \$495.90; 382 qt., \$497.20; 383 qt., \$498.50; 384 qt., \$499.80; 385 qt., \$501.10; 386 qt., \$502.40; 387 qt., \$503.70; 388 qt., \$505.00; 389 qt., \$506.30; 390 qt., \$507.60; 391 qt., \$508.90; 392 qt., \$510.20; 393 qt., \$511.50; 394 qt., \$512.80; 395 qt., \$514.10; 396 qt., \$515.40; 397 qt., \$516.70; 398 qt., \$518.00; 399 qt., \$519.30; 400 qt., \$520.60; 401 qt., \$521.90; 402 qt., \$523.20; 403 qt., \$524.50; 404 qt., \$525.80; 405 qt., \$527.10; 406 qt., \$528.40; 407 qt., \$529.70; 408 qt., \$531.00; 409 qt., \$532.30; 410 qt., \$533.60; 411 qt., \$534.90; 412 qt., \$536.20; 413 qt., \$537.50; 414 qt., \$538.80; 415 qt., \$540.10; 416 qt., \$541.40; 417 qt., \$542.70; 418 qt., \$544.00; 419 qt., \$545.30; 420 qt., \$546.60; 421 qt., \$547.90; 422 qt., \$549.20; 423 qt., \$550.50; 424 qt., \$551.80; 425 qt., \$553.10; 426 qt., \$554.40; 427 qt., \$555.70; 428 qt., \$557.00; 429 qt., \$558.30; 430 qt., \$559.60; 431 qt., \$560.90; 432 qt., \$562.20; 433 qt., \$563.50; 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487 qt., \$633.70; 488 qt., \$635.00; 489 qt., \$636.30; 490 qt., \$637.60; 491 qt., \$638.90; 492 qt., \$640.20; 493 qt., \$641.50; 494 qt., \$642.80; 495 qt., \$644.10; 496 qt., \$645.40; 497 qt., \$646.70; 498 qt., \$648.00; 499 qt., \$649.30; 500 qt., \$650.60; 501 qt., \$651.90; 502 qt., \$653.20; 503 qt., \$654.50; 504 qt., \$655.80; 505 qt., \$657.10; 506 qt., \$658.40; 507 qt., \$659.70; 508 qt., \$661.00; 509 qt., \$662.30; 510 qt., \$663.60; 511 qt., \$664.90; 512 qt., \$666.20; 513 qt., \$667.50; 514 qt., \$668.80; 515 qt., \$670.10; 516 qt., \$671.40; 517 qt., \$672.70; 518 qt., \$674.00; 519 qt., \$675.30; 520 qt., \$676.60; 521 qt., \$677.90; 522 qt., \$679.20; 523 qt., \$680.50; 524 qt., \$681.80; 525 qt., \$683.10; 526 qt., \$684.40; 527 qt., \$685.70; 528 qt., \$687.00; 529 qt., \$688.30; 530 qt., \$689.60; 531 qt., \$690.90; 532 qt., \$692.20; 533 qt., \$693.50; 534 qt., \$694.80; 535 qt., \$696.10; 536 qt., \$697.40; 537 qt., \$698.70; 538 qt., \$700.00; 539 qt., \$701.30; 540 qt., \$702.60; 541 qt., \$703.90; 542 qt., \$705.20; 543 qt., \$706.50; 544 qt., \$707.80; 545 qt., \$709.10; 546 qt., \$710.40; 547 qt., \$711.70; 548 qt., \$713.00; 549 qt., \$714.30; 550 qt., \$715.60; 551 qt., \$716.90; 552 qt., \$718.20; 553 qt., \$719.50; 554 qt., \$720.80; 555 qt., \$722.10; 556 qt., \$723.40; 557 qt., \$724.70; 558 qt., \$726.00; 559 qt., \$727.30; 560 qt., \$728.60; 561 qt., \$729.90; 562 qt., \$731.20; 563 qt., \$732.50; 564 qt., \$733.80; 565 qt., \$735.10; 566 qt., \$736.40; 567 qt., \$737.70; 568 qt., \$739.00; 569 qt., \$740.30; 570 qt., \$741.60; 571 qt., \$742.90; 572 qt., \$744.20; 573 qt., \$745.50; 574 qt., \$746.80; 575 qt., \$748.10; 576 qt., \$749.40; 577 qt., \$750.70; 578 qt., \$752.00; 579 qt., \$753.30; 580 qt., \$754.60; 581 qt., \$755.90; 582 qt., \$757.20; 583 qt., \$758.50; 584 qt., \$759.80; 585 qt., \$761.10; 586 qt., \$762.40; 587 qt., \$763.70; 588 qt., \$765.00; 589 qt., \$766.30; 590 qt., \$767.60; 591 qt., \$768.90; 592 qt., \$770.20; 593 qt., \$771.50; 594 qt., \$772.80; 595 qt., \$774.10; 596 qt., \$775.40; 597 qt., \$776.70; 598 qt., \$778.00; 599 qt., \$779.30; 600 qt., \$780.60; 601 qt., \$781.90; 602 qt., \$783.20; 603 qt., \$784.50; 604 qt., \$785.80; 605 qt., \$787.10; 606 qt., \$788.40; 607 qt., \$789.70; 608 qt., \$791.00; 609 qt., \$792.30; 610 qt., \$793.60; 611 qt., \$794.90; 612 qt., \$796.20; 613 qt., \$797.50; 614 qt., \$798.80; 615 qt., \$800.10; 616 qt., \$801.40; 617 qt., \$802.70; 618 qt., \$804.00; 619 qt., \$805.30; 620 qt., \$806.60; 621 qt., \$807.90; 622 qt., \$809.20; 623 qt., \$810.50; 624 qt., \$811.80; 625 qt., \$813.10; 626 qt., \$814.40; 627 qt., \$815.70; 628 qt., \$817.00; 629 qt., \$818.30; 630 qt., \$819.60; 631 qt., \$820.90; 632 qt., \$822.20; 633 qt., \$823.50; 634 qt., \$824.80; 635 qt., \$826.10; 636 qt., \$827.40; 637 qt., \$828.70; 638 qt., \$830.00; 639 qt., \$831.30; 640 qt., \$832.60; 641 qt., \$833.90; 642 qt., \$835.20; 643 qt., \$836.50; 644 qt., \$837.80; 645 qt., \$839.10; 646 qt., \$840.40; 647 qt., \$841.70; 648 qt., \$843.00; 649 qt., \$844.30; 650 qt., \$845.60; 651 qt., \$846.90; 652 qt., \$848.20; 653 qt., \$849.50; 654 qt., \$850.80; 655 qt., \$852.10; 656 qt., \$853.40; 657 qt., \$854.70; 658 qt., \$856.00; 659 qt., \$857.30; 660 qt., \$858.60; 661 qt., \$859.90; 662 qt., \$861.20; 663 qt., \$862.50; 664 qt., \$863.80; 665 qt., \$865.10; 666 qt., \$866.40; 667 qt., \$867.70; 668 qt., \$869.00; 669 qt., \$870.30; 670 qt., \$871.60; 671 qt., \$872.90; 672 qt., \$874.20; 673 qt., \$875.50; 674 qt., \$876.80; 675 qt., \$878.10; 676 qt., \$879.40; 677 qt., \$880.70; 678 qt., \$882.00; 679 qt., \$883.30; 680 qt., \$884.60; 681 qt., \$885.90; 682 qt., \$887.20; 683 qt., \$888.50; 684 qt., \$889.80; 685 qt., \$891.10; 686 qt., \$892.40; 687 qt., \$893.70; 688 qt., \$895.00; 689 qt., \$896.30; 690 qt., \$897.60; 691 qt., \$898.90; 692 qt., \$900.20; 693 qt., \$901.50; 694 qt., \$902.80; 695 qt., \$904.10; 696 qt., \$905.40; 697 qt., \$906.70; 698 qt., \$908.00; 699 qt., \$909.30; 700 qt., \$910.60; 701 qt., \$911.90; 702 qt., \$913.20; 703 qt., \$914.50; 704 qt., \$915.80; 705 qt., \$917.10; 706 qt., \$918.40; 707 qt., \$919.70; 708 qt., \$921.00; 709 qt., \$922.30; 710 qt., \$923.60; 711 qt., \$924.90; 712 qt., \$926.20; 713 qt., \$927.50; 714 qt., \$928.80; 715 qt., \$930.10; 716 qt., \$931.40; 717 qt., \$932.70; 718 qt., \$934.00; 719 qt., \$935.30; 720 qt., \$936.60; 721 qt., \$937.90; 722 qt., \$939.20; 723 qt., \$940.50; 724 qt., \$941.80; 725 qt., \$943.10; 726 qt., \$944.40; 727 qt., \$945.70; 728 qt., \$947.00; 729 qt., \$948.30; 730 qt., \$949.60; 731 qt., \$950.90; 732 qt., \$952.20; 733 qt., \$953.50; 734 qt., \$954.80; 735 qt., \$956.10; 736 qt., \$957.40; 737 qt., \$958.70; 738 qt., \$960.00; 739 qt., \$961.30; 740 qt., \$962.60; 741 qt., \$963.90; 742 qt., \$965.20; 743 qt., \$966.50; 744 qt., \$967.80; 745 qt., \$969.10; 746 qt., \$970.40; 747 qt., \$971.70; 748 qt., \$973.00; 749 qt., \$974.30; 750 qt., \$975.60; 751 qt., \$976.90; 752 qt., \$978.20; 753 qt., \$979.50; 754 qt., \$980.80; 755 qt., \$982.10; 756 qt., \$983.40; 757 qt., \$984.70; 758 qt., \$986.00; 759 qt., \$987.30; 760 qt., \$988.60; 761 qt., \$989.90; 762 qt., \$991.20; 763 qt., \$992.50; 764 qt., \$993.80; 765 qt., \$995.10; 766 qt., \$996.40; 767 qt., \$997.70; 768 qt., \$999.00; 769 qt., \$1000.30; 770 qt., \$1001.60; 771 qt., \$1002.90; 772 qt., \$1004.20; 773 qt., \$1005.50; 774 qt., \$1006.80; 775 qt., \$1008.10; 776 qt., \$1009.40; 777 qt., \$1010.70; 778 qt., \$1012.00; 779 qt., \$1013.30; 780 qt., \$1014.60; 781 qt., \$1015.90; 782 qt., \$1017.20; 783 qt., \$1018.50; 784 qt., \$1019.80; 785 qt., \$1021.10; 786 qt., \$1022.40; 787 qt., \$1023.70; 788 qt., \$1025.00; 789 qt., \$1026.30; 790 qt., \$1027.60; 791 qt., \$1028.90; 792 qt., \$1030.20; 793 qt., \$1031.50; 794 qt., \$1032.80; 795 qt., \$1034.10; 796 qt., \$1035.40; 797 qt., \$1036.70; 798 qt., \$1038.00; 799 qt., \$1039.30; 800 qt., \$1040.60; 801 qt., \$1041.90; 802 qt., \$1043.20; 803 qt., \$1044.50; 804 qt., \$1045.80; 805 qt., \$1047.10; 806 qt., \$1048.40; 807 qt., \$1049.70; 808 qt., \$1051.00; 809 qt., \$1052.30; 810 qt., \$1053.60; 811 qt., \$1054.90; 812 qt., \$1056.20; 813 qt., \$1057.50; 814 qt

Jobbers \$0.50@1.00, and Common, Plain
Steel Shells are generally sold by jobbers
at about \$7.00.

Sieves and Sifters—
Hunter's Imitation, gro. \$11.00@11.50
Buffalo Metallic Blue, S. S. & Co., gr. 14
14 16 18 20
\$12.00 \$13.80 \$15.00
F. J. Meyers' Mfg. Co.:
Electric Light, gr. \$11.00
Hunter's Genuine, gr. \$12.50
No Name, Hunter's, gr. \$11.00
Standard, gr. \$11.00
Shaker (Barber's Pat.) Flour Sifters,
gr. \$2.00, 90%

Sieves, Tin Rim—
Per dozen
Mesh 14 16 18 20
Black, full size, \$0.95 98 1.00 1.10
Plated, full size, \$1.05 1.03 1.10 1.20
Black, scant, \$0.75 80 85 93

Sieves, Wooden Rim—
Nested, 10, 11 and 12 inch.
Mesh 18, Nested, doz. \$0.55@0.75
Mesh 20, Nested, doz. 75@85
Mesh 24, Nested, doz. 90@1.00

Sinks—
Cast Iron—
Standard list, 65¢@1.00@70¢. 4
NOTE.—There is not entire uniformity
in size used by jobbers.

Wrought Steel—
New Era, Galv'd and Enamelled, 70¢@75¢
New Era, Painted, 60¢@65¢
L. & G. Mfg. Co., Galvanized, 50¢
L. & G. Mfg. Co., Enamelled, 50¢

Skilns, Wagon—
Cast Iron, 70¢@1.00@75¢
Malleable Iron, 40¢@1.00@50¢
Steel, 40¢@1.00@105¢

Slates—
Factory Shipments.
"D" Slates, 60¢@1.00@1.05
Unexcelled, etc., Noiseless Slates, 60¢
& 8 ten's 65¢

Wire Bound—
7 ten's 65¢
Web Hinge, 50¢@1.00@55¢

Slaw Cutters—See Cutters.
Slicers, Vegetable—
Sterling \$2.00, 33¢

Snaps, Harness—
German, 40¢@1.00@1.05
Covert Mfg. Co.:
Derby, 35¢@45¢
High Grade, 45¢@55¢
Jockey, 40¢@45¢
Trojan, 45¢@55¢
Yankee, 35¢@45¢
Yankee, Roller, 30¢@45¢

Covert's Saddlery Works—
Crown, 60¢
German, 60¢
Model, 60¢
Triumph, 60¢

W. & E. T. Hitch Co.:—
Bristol, 40¢@1.05
Empire, 50¢@55¢
German, 40¢
National, 50¢@55¢
Perfect, 45¢
Clipper, 50¢@55¢
Champion, 40¢
Security, 40¢
Victor, 60¢@55¢

Oneida Community:—
Solid Steel, 65¢@85¢ 05
Solid Silver, 55¢@1.05@1.10
Sargent's Patent Flat Ware, 60¢@1.05

Snaths—
Scythe, 45¢@55¢
Snips, Tinners'—See Shears

Soldering Irons—
See Irons, Soldering.
Spoke Trimmers—
See Trimmers, Spoke.

Spoons and Forks—
Silver Plated—
Good Quality, 50¢@1.00@1.05
Cheap, 40¢@1.00@1.05

Tinned Iron—
International Silver Co.,
1847 Rogers Bros. and Rogers & Hamil-
ton, 40¢@45¢
Rogers & Bro., William Rogers Eagle
Brand, 35¢@40¢
Anchor, Rogers Brand, 60¢
Wm. Rogers & Son, 60¢@1.05
Simoon L. & Geo. H. Rogers Co.,
Silver Plated Flat Ware, 60¢
No. 77 Silver Plated Ware, 60¢@1.05

Miscellaneous—
German Silver, 60¢@1.00@1.05
Simoon L. & Geo. H. Rogers Co.,
German or Nickel Silver, Special List
1. & 105

Carriage, Wagon, &c.
1 1/4 in. and wider:
Black or 1/4 Bright, lb. 50¢
Bright, lb. 55¢
Painted Seat Springs:
1 1/2 x 2 1/2 and smaller, per pr 45¢@50¢
1 1/2 x 2 1/2 and 3 1/2, per pr 55¢@60¢
1 1/2 x 2 1/2 and narrower, per pr
70¢@75¢

Sprinklers, Lawn—
Enterprise, 25¢@30¢
Philadelphia No. 1, 2 doz. \$12; No. 2,
\$15; No. 3, \$24.

Squares—
Nickel plated, List Jan. 5, 1901
Steel and Iron, 70¢@1.00@75¢
Rosewood Hd. Try Square and T-Bevel,
60¢@1.00@1.05
Iron Hd. Try Square and T-Bevel,
1.00@1.05@1.10
Dixton's Try Sq. and T-Bevel, 80¢@1.05
Winterbottom's Try and Miter, 30¢@1.05

Squeezers—
Lemon—
Wood, Common, gro., No. 6, \$5.15
@5.50; No. 1, \$6.50@6.50.
Wood, Porcelain Lined:
Cheap, doz. \$3.00@2.75
Good Grade, doz. \$3.00@5.00
Tinned Iron, doz. \$0.75@1.25
Iron, Porcelain Lined doz. \$2.50@3.25
Jennings' Star, doz. \$1.55@1.90

Staples—
Barbed Blind, lb. 7¢@7.40
Electricians', Association list,
80¢@1.00@1.10
Fence Staples, same price as Barbed
Wire. See Trade Report.
Poultry Netting, Staples, per lb.,
3 1/4@3.40

Steels, Butchers'—
Dick's, 80¢
Foster Bros., 80¢
Hartzell Cutlery Co., 80¢
C. & A. Hoffmann's, 40¢

Stocks and Dies—
Blacksmiths', 40¢@1.00@1.05
Gardner Die Stocks No. 1, 50¢
Gardner Die Stocks, larger sizes, 40¢
Green River, 25¢
Lightning Screw Plate, 25¢
Little Giant, 25¢
Reece's New Screw Plates, 25¢@30¢
Curtis Reversible Ratchet Die Stock, 25¢

Stone—
Saythe Stones—
Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 inch, \$5.00 per
gro., 12 inch, \$10.00

Oil Stones, &c.
Chicago Wheel & Mfg. Co.:
Gem Corundum Oil, Double Grit, 50¢
Gem Corundum Oil, Single or Double
Grit, 50¢
Gem Corundum Slips, 50¢
Gem Corundum Razor Hones, 50¢

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Chicago Wheel & Mfg. Co.:
Gem Corundum Oil, Double Grit, 50¢
Gem Corundum Oil, Single or Double
Grit, 50¢
Gem Corundum Slips, 50¢
Gem Corundum Razor Hones, 50¢

Miscellaneous—
Double Point Tacks, 90¢@6 or 7 tens
Steel Wire Brads, R. & E. Mfg.
Co.'s list, 60¢@1.00@90¢
See also Nails, Wire.

Tanks, Oil—
Emerald, S. S. & Co., 30-gal. \$3.90
Emerald, S. S. & Co., 60-gal. \$4.00
Queen City S. S. & Co., 30-gal. \$3.50
Queen City S. S. & Co., 60-gal. \$4.25

Tapes, Measuring—
American Asses' Skin, 40¢@1.00@90¢
Patent Leather, 35¢@50¢@55¢
Steel, 40¢@1.00@1.05
Chesterman's, 25¢@25¢@55¢
Eddy's Steel, 40¢@1.00@1.05
Eddy's Metallic, 35¢@35¢@55¢
Koufel & Esser Co., Steel and Metallic,
Lower list, 1899, 35¢@35¢@55¢
Lufkin's Steel, 35¢@35¢@55¢
Lufkin's Metallic, 30¢@30¢@55¢

Teeth Harrow—
Steel Harrow Teeth, plain or head-
ed, bas. per lb., 94¢

Thermometers—
Tin Case, 80¢@1.00@30¢@1.05

Ties, Bale—Steel.
Standard Wire, 50¢@1.00@55¢

Ties, Wall—
Cleveland Wire Spring Co.:
Galv. Steel 5 3/8 x 6 1/4 in. # 1000, \$10.00
Galv. Steel 5 3/8 x 8 1/4 in. # 1000, \$11.00
Galv. Steel 5 3/8 x 11 1/4 in. # 1000, \$12.00
Galv. Steel 5 3/8 x 15 1/4 in. # 1000, \$14.00

Tinners' Shears, &c.—
See Shears, Tinners', &c.

Tinware—
Stamped, Japanned and Pieced, sold
very generally at net prices.

Tire Benders, Upsetters,
&c.—See Benders and Upset-
ters, Tire.

Tobacco Cutters—
See Cutters, Tobacco.

Tools—
Coopers'—
L. & I. J. White, 90¢@1.00@55¢

Saw—
Atkins' Cross Cut Saw Tools, 40¢
Simonds' Improved, 35¢@45¢
Simonds' Crescent, 25¢

Ship—
L. & I. J. White, 25¢

Transom Lifters—
See Lifters, Transom.

Traps—
Fly—
Balloon, Globe or Acme, 84¢@90¢
Mouse, Round or Square Wire, 84¢@90¢
Harper, Champion or Paragon,
doz. \$1.15@1.35; gro. \$10.50@11.00
doz. \$1.25@1.40; gro. \$12.00@12.50

Game—
Oneida Pattern, 75¢@1.00@50¢@55¢
Newhouse, 45¢@45¢@55¢
Hawley & Norton, 85¢@85¢@1.05
Victor (Oneida Pattern), 75¢@75¢@85¢
Star (Blake Pattern), 85¢@1.00@70¢@55¢

Mouse and Rat—
Mouse, Wood, Choker, doz. holes, 84¢@90¢
Mouse, Round or Square Wire, 84¢@90¢
American Pattern French Rat and Mouse
Traps—
No. 1, Detroit Marty Pattern, 40¢
No. 2, Detroit Marty Pattern, 40¢
No. 3, Rat, 40¢
No. 4, Rat, 40¢
No. 5, Mouse, 40¢
No. 6, Rat, 40¢
No. 7, Rat, 40¢
No. 8, Rat, 40¢
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No. 96, Rat, 40¢
No. 97, Rat, 40¢
No. 98, Rat, 40¢
No. 99, Rat, 40¢
No. 100, Rat, 40¢

Target—
Markle's, each, 85¢

Trimmers, Spoke—
Bonney's Nos. 1 and 2, 40¢

Trowels—
Dixton Brick and Pointing, 80¢
Dixton Plastering, 25¢
Dixton "Standard Brand" and Gar-
den Trowels, 40¢
Never-Break Steel Garden Trowels,
gro. \$7.00

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, 50¢
Daisy Stove Trucks, Improved pattern,
doz. \$18.50
Model Stove Trucks, doz. \$18.50

Tub, Wash—
No. 1 2 3
Galvanized, per doz. \$5.00 5.50 6.00
Galvanized Wash Tub (S. S. & Co.),
8 1 9 3 10 20 80
Per doz. \$5 25 6.00 6.75 6.50 7.25 7.00

Twine—
Miscellaneous—
Flax Twine—
No. 9, 14 and 1/4-lb. Balls, 25¢ 24¢
No. 12, 14 and 1/4-lb. Balls, 18¢ 20¢
No. 13, 14 and 1/4-lb. Balls, 18¢ 18¢
No. 24, 14 and 1/4-lb. Balls, 15¢ 17¢
No. 35, 14 and 1/4-lb. Balls, 15¢ 17¢

Chalk Line, Cotton, 1/4-lb. Balls—
25¢@25¢
Cotton Mops, 6, 9, 12 and 15 lb. to
doz., 7¢@8¢

Cotton Wrapping, 5 Balls to lb.
according to quality, 10¢@11¢
American 3-Ply Hemp, 1/4 and 1/2-lb.
Balls, 18¢@15¢
American 3-Ply Hemp, 1-lb. Balls, 15¢@15¢

India 2-Ply Hemp, 1/4 and 1/2-lb.
Balls (Spring Twine), 84¢
India 2-Ply Hemp, 1-lb. Balls, 84¢
India 3-Ply Hemp, 1/4-lb. Balls, 7¢
2, 3, 4 and 5-Ply Jute, 1/4-lb. Balls, 9¢@10¢

Mason Line, Linen, 1/4-lb. Balls, 15¢
No. 25, Mattress, 1/4 and 1/2-lb. Balls, 5¢
Wool, 3 to 6 ply, 64¢

Vises—
Solid Box, 50¢@80¢@105¢

Parallel—
Athol Machine Co.:
Simpson's Adjustable, 40¢
Standard, 40¢
Amateur, 25¢
Bonney's, 40¢
Fisher & Norris Double Screw, 15¢@10¢
Holland's, 40¢
Key-tone, 65¢@55¢
Lewis Tool Co., 20¢@30¢
Massey's Perfect, 15¢@20¢
Massey's, 80¢@40¢
Combination, Quick Adj., 40¢
Woodworker's, 15¢@20¢
Merrill's, 20¢
Miller's Falls, 50¢@1.00@1.05
Parker's:
Victor, 20¢@25¢
Regulars, 20¢@25¢
Regulars, 20¢@25¢
Combination Pipe, 55¢@80¢
Prentiss, 20¢@25¢
Sargent's, 40¢
Snedker's X. L., 20¢@25¢
Stephens, 20¢@25¢
Columbian Haw. Co., 40¢

Saw Filers—
Bonney's No. 1, \$13; No. 2, \$16, 50¢
Dixton's D S Clamp and Guide, 25¢
\$30, 25¢
Reading, 60¢
Westworth's Rubber Jaw, Nos. 1, 2
and 3, 45¢@50¢

Miscellaneous—
Bignall & Keeler Combination Pipe
Vise, 60¢

Parker's Combination Pipe:
87 Series, 60¢
187 Series, 60¢@55¢
No. 870, 40¢

Wads—Price Per M.
B. E., 11 up, 60¢
B. E., 9 and 10, 70¢
B. E., 8, 80¢
B. E., 7, 80¢
P. E., 11 up, \$1.00
P. E., 9 and 10, 1.35
P. E., 8, 1.50
P. E., 7, 1.50
Ely's B. E., 11 and larger, \$1.70@1.75
Ely's P. E., 12 to 20, \$3.00@3.25

Wagon Jacks—
See Jacks, Wagon.

Brass Surface:
Brass King, Single Surface, open
back \$3.00
Nickel Plate Surface:
No. 1901 Nickel Plate, Single Surface
..... \$3.00

Washers—
Leather, Axle—
Solid \$5.10 @ \$10.00 @ \$5.10 @ \$10.00
Patent \$5.10 @ \$10.00 @ \$5.10 @ \$10.00
Coil: 1/2 1 1 1/2 1 3/4 1 1/2
10c 11c 12c 13c per 100

Iron or Steel—
Size bolt ... 5-16 3/8 1/2 5/8 3/4
Washers ... \$5.10 4.20 3.40 2.70 2.10 1.50
In lots less than one keg add 1/4c per
lb., 5-lb. boxes add 1/2c to list.
Cast Washers—
Over 1/2 inch. barrel lots. per lb. 1 1/4 @ 1 1/2c

Washer Cutters—
See Cutters, Washer.
Washing Machines—
See Machines, Washing.
Water Coolers—
See Coolers, Water.
Wedges—
Old Finish lb. 2.90 @ 3.10c
Weights, Sash—
Per ton, f.o.b. factory \$19.00 @ \$22.50

Some Foundries make price \$1 @ \$2
lower.
Well Buckets, Galvanized
See Pails, Galvanized.
Wheels Well—
8-in. \$1.50 @ 1.75; 10-in. \$1.90 @ 2.10;
12-in. \$2.35 @ 2.75; 14-in. \$3.75 @ 4.55

Wire and Wire Goods—
Bright and Annealed:
6 to 9 7 1/2 @ 5 @ 7 1/2 @ 10
10 to 18 7 1/2 @ 10 @ 7 1/2 @ 10 @ 5
19 to 26 7 1/2 @ 10 @ 7 1/2 @ 10 @ 5
27 to 36 7 1/2 @ 10 @ 7 1/2 @ 10 @ 5
Galvanized:
6 to 18 70 @ 70 @ 5
19 to 26 7 1/2 @ 5 @ 7 1/2 @ 10
27 to 36 7 1/2 @ 10 @ 7 1/2 @ 10 @ 5
Coppered:
6 to 9 70 @ 5 @ 70 @ 10
10 to 18 70 @ 10 @ 70 @ 10 @ 5
19 to 26 7 1/2 @ 5 @ 7 1/2 @ 10 @ 5
27 to 36 7 1/2 @ 10 @ 7 1/2 @ 10 @ 5
Tinned:
6 to 14 75 @ 75 @ 5 @ 1/2
15 to 18 7 1/2 @ 5 @ 7 1/2 @ 10
19 to 26 70 @ 5 @ 70 @ 10 @ 5
27 to 36 70 @ 10 @ 70 @ 10 @ 5
Annealed Wire on Spools .70 @ 5 @ 70
@ 10%

Brass and Copper Wire on Spools .
60 @ 5 @ 60 @ 10%
Brass, list Feb. 23, '96 . 25%
Copper, list Feb. 26, '96 . 15%
Cast Steel Wire . 50%
Stubs' Steel Wire . \$5.00 to \$2.50
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.
Bright Wire Goods—
List April 1, 1901 . 85 @ 10 @ 10
Wire Cloth and Netting—
Galvanized Wire Netting . 80 @ 20 @ 10
Painted Screen Cloth per 100 ft .
\$1.00 @ 1.10

Light Hardware Grade:
2-13 Mesh, Plain (8c. list) sq. ft. 1 1/4 @ 1 1/4c
2-18 Mesh, Galv. (8c. list) sq. ft. 2 1/4 @ 2 1/4c

Wire, Barb—See Trade Report.
Wire Rope—See Ropes, Wire.
Wrenches—
Agricultural . 70 @ 10 @ 75 @ 10%
Case lots . 75 @ 10%
Acme . 60 @ 10%
Aligator . 70 @
Baxter's S . 60 @ 10%
Ball Dog . 70 @
Bonnie & Cal's . 35 @ 5%
Adjustable S . 40%
Adjustable S Pipe . 30 @ 10%
Brigg's Pattern . 30 @ 10%

Combination Black . 40 @ 5%
Combination Bright . 40 @
Cylinder or Gas Pipe . 55 @
Extra Heavy . 45 @
Merrick's Pattern . 50 @
No. 3 Pipe, Bright . 55 @
Rindley Automatic . 50 @
Roariman's . 33 @ 1/2
Coe's Genuine . 40 @ 10 @ 5 @ 5%
Coe's "Mechanics" . 40 @ 10 @ 10 @ 5 @ 5%
Donohue's Engineer . 40 @ 10%
Eagle . 50 @ 10%
Elgin Wrenches . 7 @
Elgin Monkey Wrench Pipe Jaws . 33 @ 1/2
Gem Pocket . 30 @
Hercules . 70 @
Knife Handle, Machinists' (W. & B.) .
Case lots . 50 @ 10%
Less than case lots . 50 @ 5%
Improved Pipe (W. & B.) . 50 @
Solid Handle, P.S. & W. . 50 @ 50 @ 10%
Triumph . 60 @ 10%

Wrought Goods—
Staples, Hooks, &c., list March 17
'92 . 90 @ 10 @ 10%
Yokes Neck—
Cover Saddlery Works, Trimmed . 60 @ 25%
Cover Saddlery Works, Neck Yoke
Centers . 70 @
Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters .
list net

Zinc—
Sheet . lb 6 @ 6 @ 1/2

PAINTS, OILS AND COLORS—Wholesale Prices.

White Lead, Zinc, &c.

Lead, Engl. sh. white, in Oil. 9 1/2 @
Lead, American White, in Oil:
Lots of 500 lb or over 6 1/2 @
Lots less than 500 lb 7 @
Lead, White, in oil, 25 lb tin
pails, add to keg price. 1/2 @
Lead, White, in oil, 12 1/2 lb tin
pails, add to keg price. 1 @
Lead, White, in oil, 1 to 5 lb as-
sorted tins, add to keg price. 1 1/2 @
Lead White, Dry in bbls. 5 1/2 @ 6 @
Lead, American. Terms: On lots of 500
lbs. and over, 60 days, or 2% for cash if
paid in 15 days from date of invoice.
Zinc, American, dry. 4 1/2 @ 4 1/2 @
Zinc, Paris, Red Seal, dry. 8 1/2 @
Zinc, Paris, Green Seal, dry. 9 1/2 @
Zinc, Antwerp, Red Seal, dry. 6 1/2 @
Zinc, Antwerp, Green Seal, dry. 8 @
Zinc, V. M. French, in Poppy Oil,
Green Seal:
Lots of 1 ton and over 12 @ 12 1/2 @
Lots of less than 1 ton 12 1/2 @ 12 1/2 @
Zinc, V. M. French, in Poppy Oil,
Red Seal:
Lots of 1 ton and over 10 1/2 @ 11 1/2 @
Lots of less than 1 ton 11 @ 11 1/2 @
Discounts.—V. M. French Zinc.—Dis-
counts to buyers of 10 bbl. lots of one or
assorted grades, 15: 25 bbls., 25; 50
bbls., 4%.

Dry Colors.
Black, Carbon. 5 @ 20 @
Black, Drop, Amer. 4 @ 7 @
Black, Drop, Eng. 7 @ 11 @
Black, Ivory. 12 @ 21 @
Blue, Celestial. 4 1/2 @ 6 @
Blue, Chinese. 30 @ 35 @
Blue, Prussian. 28 @ 34 @
Blue, Ultramarine. 4 @ 20 @
Brown, Spanish. 1 1/2 @ 1 @
Brown, Vandyke, Amer. 1 1/2 @ 2 1/2 @
Brown, Vandyke, Foreign. 3 1/2 @ 3 1/2 @
Carmine, No. 40. 1 1/2 @ 2 1/2 @
Green, Chrome, ordinary. 5 @ 6 1/2 @

Green, Chrome, pure. 18 @ 20 @
Lead, Red, bbls. 1/2 bbls. and kegs:
Lots 500 lb or over. 8 @
Lots less than 500 lb. 8 1/2 @
Litharge, bbls. 1/2 bbls. and kegs:
Lots 500 lb or over. 8 @
Lots less than 500 lb. 8 1/2 @
Ocher, French Washed. 1 1/4 @ 1 1/4 @
Ocher, Dutch Washed. 4 1/2 @ 5 @
Ocher, American. 10 @ 10 @ 10 @ 10 @
Orange Mineral, English. 11 1/2 @ 11 1/2 @
Orange Mineral, German. 8 @ 10 1/2 @
Orange Mineral, American. 8 @ 8 1/2 @
Red, Indian, English. 4 1/2 @ 8 1/2 @
Red, Indian, American. 3 @ 3 1/2 @
Red, Turkey, English. 4 @ 6 @
Red, Tuscan, English. 7 @ 10 @
Red, Venetian, Amer. 80 @ 1.75 @
Red, Venetian, English. 100 @ 1.80 @ 3.00 @
Sienna, Italian, Burnt and
Powdered. 3 1/2 @ 3 1/2 @ 7 1/2 @
Sienna, Ital., Raw, Powd. 3 1/2 @ 7 1/2 @
Sienna, American, Raw. 1 1/2 @ 2 @
Sienna, American, Burnt and
Powdered. 1 1/2 @ 2 @
Talc, French. 100 @ 1.25 @ 1.50 @
Talc, American. 90 @ 1.10 @
Terra Alba, French. 100 @ 1.50 @
Terra Alba, English. 95 @ 1.00 @
Terra Alba, American No. 1. 95 @ 85 @
Terra Alba, American No. 2. 45 @ 80 @
Umber, Turkey, Bnt. & Pow. 2 1/2 @ 3 1/2 @
Umber, Turkey, Raw & Powd. 2 1/2 @ 3 1/2 @
Umber, Bnt. Amer. 1 1/2 @ 2 @
Umber, Raw, Amer. 1 1/2 @ 2 @
Yellow, Chrome. 10 1/2 @ 25 @
Vermilion, American Lead. 10 @ 10 @
Vermilion, Quicksilver, bulk. 60 @ 70 @
Vermilion, Quicksilver, bags. 60 @ 70 @
Vermilion, English, Import. 40 @ 50 @
Vermilion, Chinese. 1.05 @ 1.20 @

Colors in Oil.
Black, Lampblack. 12 @ 14 @
Blue, Chinese. 36 @ 40 @
Blue, Chinese. 32 @ 33 @
Blue, Prussian. 13 @ 16 @

Brown, Vandyke. 9 1/2 @ 13 @
Green, Chrome. 10 @ 12 @
Green, Paris. 24 @
Sienna, Raw. 10 @ 13 @
Sienna, Burnt. 10 @ 13 @
Umber, Raw. 9 1/2 @ 12 @
Umber, Burnt. 9 1/2 @ 12 @

Miscellaneous.

Barytes, Foreign, 1/2 ton. \$19.00 @ \$21.00
Barytes, Amer. doated. 19.00 @ 20.00
Barytes, Crude, No 1. 9.00 @ 10.00
Chalk, in bulk. 2.50 @ 2.80
China Clay, English. 1/2 ton. 13.00 @ 17.50
Cobalt, Oxide. 100 @ 2.25 @ 2.50
Whiting, Common. 1/2 ton. 40 @ 60
Whiting, Gliders. 45 @ 65
Whiting, extra Gliders. 55 @ 68

Putty.

In bladders. \$2.25
In cans 1 lb to 5 lb. 1.35
In cans 12 lb to 25 lb. 3.25

Spirits Turpentine.

In Southern bbls. 38 @ 38 1/2 @
In machine bbls. 38 1/2 @ 39 @

Glue.

Cabinet. 11 1/4 @ 16
Extra White. 18 @ 33
French. 12 @ 40
Irish. 13 @ 16
Low Grade. 9 @ 12
Medium White. 14 1/2 @ 18 1/2

Animal, Fish and Vegetable Oils.

Linseed, City, raw. 60 @ 66

Linseed, City, boiled. 63 @ 68
Linseed, State and West'n, raw. 57 @ 65
Linseed, raw Calcutta see 1. 66 @
Lard, Prime. 7 @ 7 1/2 @
Lard, Extra No. 1. 52 @ 51 @
Lard, No. 1. 43 @ 46 @
Cotton-seed, Crude. 57 @ 58 @
Cotton-seed, Summer Yellow,
prime. 34 @ 36 @
Cotton-seed Summer Yellow,
off grades. 34 @ 35 @
Sperm, Crude. 60 @ 61 @
Sperm, Natural Spring. 61 @ 61 @
Sperm, Bleached Spring. 61 @ 61 @
Sperm, Natural Winter. 61 @ 61 @
Sperm, Bleached Winter. 61 @ 61 @
Tallow, Prime. 57 @ 58 @
Whale, Crude. 45 @ 46 @
Whale, Natural Winter. 45 @ 46 @
Whale, Bleached Winter. 47 @ 48 @
Menhaden, Crude, Sound. 42 @ 43 @
Menhaden, Light Strained. 30 @ 31 @
Menhaden, Bleached Winter. 33 @ 34 @
Menhaden, Ex. Bleached Winter. 35 @ 36 @
Cocoanut, Ceylon. 6 1/2 @ 7 @
Cocoanut, Coochin. 7 @ 9 @
Cod, Domestic. 32 @ 33 @
Cod, Newfoundland. 35 @ 36 @
Red Flaine. 12 @
Red Saponified. 5 @ 6 1/2 @
Olive, Italian, bbls. 58 @ 62 @
Nestafont, prime. 59 @ 53 @
Palm, prime, Lagos. 5 1/2 @ 5 1/2 @

Mineral Oils.
Black, 20 gravity, 25 @ 30 cold
test. 9 1/2 @ 10 1/2 @
Black, 29 gravity, 15 cold test. 10 @ 11 1/2 @
Black, summer. 9 1/2 @ 9 1/2 @
Cylinder, light filtered. 14 1/2 @ 15 1/2 @
Cylinder, dark filtered. 11 1/2 @ 12 1/2 @
Paraffine, 903-907 gravity. 12 1/2 @ 13 1/2 @
Paraffine, 903 gravity. 11 1/2 @ 12 1/2 @
Paraffine, 883 gravity. 9 1/2 @ 10 @
Paraffine, red, No. 1. 12 1/2 @ 13 1/2 @
In small lots 1/2 advance.

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades,
and a standard authority on all matters relating to those branches of industry.

RATES OF SUBSCRIPTION: INCLUDING POSTAGE.

Regular Edition, Issued every THURSDAY morning, \$5.00 a year
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Entered at the Post Office, New York, as second-class Matter.

